

A RECREATIONAL FISHERY SURVEY OF SODUS BAY



Matthew Sanderson
Sr. Aquatic Biologist



NYS Department of Environmental Conservation
Region 8 Bureau of Fisheries
6274 East Avon-Lima Road
Avon, New York 14414



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ABSTRACT

A one year recreational fishery survey was conducted on Sodus Bay from April 1, 2008 to March 31, 2009. A roving-roving survey design was used to estimate angling effort, catch, and harvest for three fishing seasons during the 2008-09 fishing year. During a total of 231 survey days (205 daytime, 26 May-July nighttime) creel survey agents conducted 3,268 interviews, which comprised 6,973 anglers who fished 24,988 hours. The average party size was 2.1 anglers. Anglers interviewed from complete trips on average fished for 5.2 hours.

It is estimated that anglers fished Sodus Bay for approximately 59,560 angler hours (SE=3,754) from 11,410 boat trips, and 97,730 angler hours (SE=7,674) from 24,254 shore angler trips, during the daytime. Anglers fished Sodus Bay at night for approximately 1,940 angler hours (SE=520) from 372 boat trips, and 2,126 angler hours (SE=393) from 958 shore angler trips. During the survey, ice fishing was recorded as shore fishing. The majority of the daytime shore fishing effort took place during 76 days of safe ice from December 14, 2008 to March 14, 2009. Boat fishing accounted for most of the open water (April through November) fishing season. Yellow perch fishing accounted for about 17% of the total estimated daytime boat fishing effort, 74% of the daytime shore fishing effort, and nearly all of the effort in December through March. Forty two percent of the estimated daytime boat fishing effort was directed at bass, followed by fishing for anything (19%). Fishing for anything made up approximately 11% of the daytime shore effort, followed by panfish (9%). Fishing for bass accounted for 57% of the estimated nighttime boat fishing effort, followed by pike (20%), anything, and walleye (9% each). Thirty percent of the nighttime shore fishing effort was for anything, followed by bullhead (26%), and panfish (21%).

An estimated 783,290 panfish were caught from Sodus Bay for a catch rate of 4.9 fish per angler hour. Slightly less than one third, or 237,370 panfish, were harvested (1.5 per angler hour). Most of the panfish catch was yellow perch, where an estimated 619,380 were caught (3.8 per angler hour) and 192,490 were harvested (1.2 per angler hour). About two thirds of the yellow perch caught and harvested came through the ice. An estimated 75,350 warm water gamefish were caught from Sodus Bay for a catch rate of 0.47 fish per angler hour. It is estimated that only 3,260 warm water gamefish were harvested (0.02 per angler hour). Ninety two percent of the warm water gamefish catch was comprised of largemouth bass. An estimated 69,120 were caught at a rate of 0.43 per hour, only 2,430 were kept (0.02 per angler hour), and 63% of the largemouth bass released were legal sized. An estimated 106 walleye (<0.01 per angler hour) were caught, 59 (56%) were creeled and 55% of the walleye released were legal sized. Five hundred eighty northern pike and 19 walleye were caught through the ice. An estimated 10 Chinook salmon, 34 rainbow trout, and 46 brown trout were caught. All of the Chinook salmon and nearly all of the brown trout were kept. About half of the rainbow trout were released, and most of the released rainbows were legal sized.

The directed effort open water boat fishing catch rate for yellow perch was an outstanding 6.6 perch per angler hour, while the directed effort open water shore fishing catch rate for yellow perch was a similarly outstanding 7.1 perch per angler hour. The ice fishing directed effort catch rate for yellow perch was an excellent 4.4 perch per angler hour. Excellent catch rates were also observed for anglers targeting panfish, anything, gamefish, and bass. Bass anglers are taking advantage of, and generally complying with, a new off-season catch and release regulation. Angler effort targeting northern pike and walleye was comparatively low, and the directed effort catch rate of walleye was somewhat low, suggesting that despite relatively abundant populations, they are underutilized, and/or difficult to find and catch.

INTRODUCTION

Sodus Bay is a large embayment (surface area 3,357 acres, or 13.6 km²) of Lake Ontario, located 35 miles east of Rochester, New York. It is considered a moderately shallow, eutrophic bay with a maximum depth of 48 feet (15 m) and a mean depth of 18 feet (5.5 m). The Sodus Bay watershed covers an area of 46 square miles (119 km²) in Wayne County. The majority of the basin is drained by Sodus Creek (watershed area 19 square miles, or 49 km²), which feeds in to the south end of the bay. Extensive macrophyte beds cover approximately 37 percent of the bay's surface area (Gilman and Smith 1988; Princeton Hydro LLC 2007). It is primarily a warm water fishery composed of walleye (*Sander vitreus*), northern pike (*Esox lucius*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), pumpkinseed (*Lepomis gibbosus*) and bluegill sunfish (*Lepomis macrochirus*), yellow perch (*Perca flavescens*), white perch (*Morone americana*), gizzard shad (*Dorosoma cepedianum*), and brown bullhead (*Amerius nebulosus*). Because it is connected to Lake Ontario by a dredged channel, and because the bay lies between Lake Ontario and spawning tributaries, Sodus, Second and Third Creeks, migratory species such as Chinook salmon (*Onchorynchus tshawytscha*), coho salmon (*Onchorynchus kisutch*), brown trout (*Salmo trutta*), and rainbow trout (*Onchorynchus mykiss*) are found in the bay at certain times of the year.

The Region 8 Fisheries Unit has intensively managed Sodus Bay for walleye. Intensive management includes stocking hatchery reared fingerlings and regulating the recreational harvest (18 inch minimum size, three per day creel limit). Black bass, black crappie (*Pomoxis nigromaculatus*), pumpkinseed and bluegill sunfish, and yellow perch are also managed by regulating the recreational harvest under statewide size and creel limits. Northern pike is managed by regulating the recreational harvest under Great Lakes regulations (22 inch minimum size and five per day creel limit). An electrofishing survey was conducted by the Department of Environmental Conservation (DEC) Region 8 Fisheries Unit in 1997 (Lane 1998) and a fish stock assessment using standard gang gill nets was conducted in 2006 (Sanderson 2010). These surveys were conducted in accordance with DEC standard sampling protocols (Forney et al. 1994; Green 1989). A long-term monitoring program has been maintained on Sodus Bay for a number of limnological variables such as temperature, nutrients, chlorophyll *a*, and zooplankton (Princeton Hydro LLC 2007, Makarewicz and Lewis 2004). This data set lacks up to date information on the human use of the resource. Angler creel surveys have never been conducted for Sodus Bay. The 1996 New York Statewide Angler Survey listed Sodus Bay as the 36th most fished water body in New York, generating an estimated 99,600 angler days of effort by 10,040 anglers (Connelly et al. 1997). More recently, the 2007 New York Statewide Angler Survey listed Sodus Bay as the 32nd most fished water body in New York, generating an estimated 93,295 angler days of effort (Connelly and Brown 2009). There is a need to examine the effects of angling, including catch rates, harvest rates, and effort, on the warm water fishery of Sodus Bay. This is needed because the stocking of pond reared walleye fingerlings under a cooperator program from 1989 to 1993 and the experimental stocking of DEC hatchery raised advanced walleye fingerlings from 1996 to 2000 has resulted in the restoration of a once-popular fishery to the bay. A plan for biannual plantings of walleye fingerlings began in 2001 but such fingerling stocking has not taken place since 2003. Also, new bass fishing regulations were implemented, beginning on October 1, 2006, to allow an early, artificial lure only, catch and release season. Lastly, an expanding double-crested cormorant (*Phalacrocorax auritus*) colony located on Newark and Eagle Islands near the north eastern shore of the bay is now causing some concern about their potential impact on warm water fish populations.

METHODS

A one year recreational fishery survey was conducted on Sodus Bay from April 3, 2008 to March 29, 2009. The survey permitted the examination of the current levels of angling effort and success on the bay. Since fisheries management is evaluated based on deliverable quantities, such as catch rates and angling hours, the following outputs of the survey included all game and pan fish with emphasis on the walleye and black bass fisheries:

1. Total effort
2. Total catch and harvest
3. Catch and harvest rates
4. Species targeted
5. Origin of fishing trips (dock/cottage on bay vs. boat launch or marina)
6. Directed effort, catch, and harvest
7. Directed catch and harvest rates

The survey was designed to estimate angling effort, catch, and harvest for three fishing seasons during the 2008-09 fishing year. Combining the results from these time periods provided total annual estimates. Periodic measurement of angling effort, catch rates, and harvest rates supplied the required data. The survey consisted of two parts: boat and shoreline angler counts and angler interviews. Primarily roving counts and interviews were conducted.

Pollock et al. (1994) recommends the use of a roving survey method for obtaining catch rate information from lakes with multiple access points, particularly lakes where, despite well developed public access facilities, a substantial amount of angling originates from private docks and shorelines. Because the shoreline of Sodus Bay is heavily developed with seasonal and permanent residences, where a large amount of fishing effort could originate, this was the method chosen for the survey. The boat roving survey, for safety reasons, required two creel agents.

Fishing Seasons

The creel survey covered twelve months over three fishing seasons: Spring/summer/fall open water daytime, (April 1 to October 31, 2008) spring/summer open water nighttime (May 1 to July 31, 2008), and winter daytime (November 1, 2008 to March 31, 2009). Because no nighttime fishing took place on Irondequoit Bay in September and nighttime fishing made up only 3.6% of the open water effort, and because the two bay's fisheries are similar (Sanderson 2009), Sodus Bay night surveys were limited to the months of May through July.

Census Days

Open water daytime survey effort was evenly divided among four time periods: 1. Weekend/holiday morning (0800-1400), 2. Weekend/holiday afternoon (1400-2000), 3. Weekday morning, and 4. Weekday afternoon. Open water night time (2000-0200) surveys were conducted twice a week on randomly selected nights, once on a weekday and once on a weekend/holiday. Friday night was considered a weekend night and Sunday night was considered a weekday night. This allowed 4 daytime and 2 nighttime slots per week to be

surveyed. Only one daytime slot (0930-1750) during the winter was surveyed on two randomly selected weekday days, and two weekend/holiday days per week.

Boat/shore Angler Count

All boats that were fishing and shoreline anglers were counted by creel agents from a boat twice during the survey time period. The first count was at zero, one, or two hours into the survey time period, randomly chosen. The second count was three hours after the first. The bay was divided into eight approximately equal size grids (Figure 1). A random numbers generator was used to determine the starting grid and direction of travel between the grids. All fishing boats and shoreline anglers within each grid were counted. The counting route took approximately 30 minutes to complete, and thus was considered instantaneous (Pollock et al. 1994). A pair of Wind River 10 X 40 binoculars aided the agents with identifying boats and people that were fishing. Additional data recorded include: air temperature, wind direction and relative magnitude, precipitation, and cloud cover. Ice fishing anglers were counted in the same manner during the winter, except that counts were made from five access points on the shoreline (Figure 1, sites 9, 11, 12, 13, and 15).

Roving Survey

The roving-roving survey design as described in Pollock et al. (1994, Chapters 11, 15) was used. Between counts, angler interviews were conducted by two creel census clerks in a boat during the open water season and by one agent on foot during the winter. As described in the previous section on the roving counts, the bay was divided into eight areas (Figure 1). A random numbers generator determined what area to begin with and which direction the clerks traveled. The clerks counted the number of boats (open water) or anglers (winter) to determine the portion of boats/anglers to interview to complete 9 five minute interviews in the area (45 minutes/area). Clerks were instructed to intercept as many boats or anglers as possible. The date, interview time, and map grid were recorded. Interview questions included: fishing method, number of anglers in boat, targeted species, time fishing began, anticipated ending time, origin of trip (launch/access point or dock/cottage on bay), if launch, what Town/County from, number of each species caught, number of each species kept, and number of legal sized fish released. Any comments the interviewee made were also recorded.

Non-uniform Probability Access Point Survey

The roving-access survey design as described in Pollock et al. (1994, Chapters 10, 15) was used when hazardous weather or ice conditions prevented a roving survey. Counts and interviews were conducted at four access points. A random numbers generator was used to determine the starting access point and the clerk's travel direction. Boats and/or anglers were counted at each area. The clerk conducted interviews for 216 minutes at the Sodus Point Village boat launch (site 11), for 72 minutes at the US Coast Guard/Wayne County Sheriff Department boat launch (site 9), and for 36 minutes at each the Bay Bridge Bait Shop and the Davenport Marina access points (site 14). During the ice season, the clerk conducted interviews for 216 minutes at Connely's Cove Marina (Figure 1, site 15), 72 minutes at the end of Spiegel Drive (site 13), and for 36 minutes at each the Sawmill Cove access point (site 12) and Sodus Point Village boat launch (site 11). The same interview as the roving survey was conducted, except that the ending time and trip origin was known.

Total Effort, Catch, and Harvest Calculations

In the field, data were entered directly into a Microsoft Access electronic database using a handheld Hewlett-Packard iPaq Pocket PC, and these were later transferred to a desktop PC. Using the desktop PC, the data were tabulated by month, weekend/weekday daytime, and nighttime. Boat and shoreline angling was treated separately. Catch and harvest results were further stratified by fish species. Daily effort was calculated with the following equation:

$$(1) \quad E = I \times T$$

where I is the mean of the two instantaneous counts of boats or shore/ice anglers for that day and T is the fishing hours for that day. Daily estimates of effort for the open water season in boat hours was multiplied by the daily mean number of anglers (from interviews) per boat for each day to determine daily effort as angler hours. Shore and ice fishing effort is expressed as angler hours. Angling effort was converted from hours to trips by dividing the total hours expended by the mean trip length, calculated from complete trips, through the open water or ice season.

Since the interviews from the boat roving survey and from shoreline anglers recorded mostly incomplete trips, the average of the individual catch rates for each angler-group for each day was used, and all trips less than 0.5 hr were ignored to eliminate the potential bias from short trips (Pollock, et al.1994). This catch rate estimator is expressed as:

$$(2) \quad R2 = \frac{\sum_{i=1}^n ci/Li}{n}$$

where ci is the catch for the ith sampling unit, Li is the length of the fishing trip at the time of the interview, and n is the number of sampling units in the sample.

Access point survey and most ice angler interviews recorded complete trips, so the ratio of the means was used to calculate the catch rate:

$$(3) \quad R1 = \frac{\sum_{i=1}^n ci/n}{\sum_{i=1}^n Li/n}$$

Catch was calculated with the following equation:

$$(4) \quad C = E \times R$$

where R is the appropriate catch rate estimator from equation (2) or (3), above. Harvest was calculated using the same rate estimators using creel fish and equation (4).

Monthly total effort, catch, and harvest and their associated standard errors were calculated in accordance with procedures outlined in Pollock et al. (1994). Monthly catch and harvest estimates and associated standard errors for walleye, northern pike, smallmouth bass,

largemouth bass, salmonids, yellow perch, and panfish (bluegill sunfish, pumpkinseed sunfish, rock bass, black crappie, and bullhead) were also calculated.

Lastly, directed angler catch rates by month were calculated using interview data from trips during which the species in question was targeted (Malvestuto 1996). The ratio of the means catch rate estimator (equation 3) was used as the measure of angling success (Grosslein 1961, Malvestuto 1996, Pollock et al. 1994) and expressed as catch per angler-hour. Rates for each period and species were calculated separately.

RESULTS

Interview Statistics

During a total of 231 survey days (205 daytime, 26 nighttime) from April 3, 2008 to March 29, 2009 creel survey agents conducted 3,268 interviews comprised of 6,973 anglers who fished 24,988 hours. The average party size was 2.1 anglers. Anglers interviewed from complete trips on average fished for 5.2 hours (Table 1). Since a roving survey was conducted on most survey days, the majority of the interviews (75%) came from incomplete trips. About two thirds (61%) of the interviews came from anglers fishing from a boat, 23% came from ice anglers, and 15% came from shore anglers. Most of the anglers interviewed were jig fishing (25%), casting (23%), or a combination of either still fishing and casting (17%), or drift fishing and casting (16%). The majority of the anglers' trips originated from a public access point (60%), rather than a private residence or marina. Thirty two percent of the anglers interviewed were fishing for yellow perch, followed by bass (31%), anything (18%), and panfish (13%) (Table 2). Most of the anglers fishing the bay resided in the immediate area (40% from Wayne County, 32% from Monroe County). Anglers came from 44 New York counties, including a fair number from the Syracuse area (4% from Onondaga County, 3% from Oswego County), or from out of state (4%) (Table 3).

Effort

It is estimated that from April 1, 2008 to March 31, 2009, anglers fished Sodus Bay for approximately 59,560 hours (SE= 3,754) from 11,410 boat trips, and 97,730 hours (SE=7,674) from 24,254 shore trips, during the daytime. Anglers fished Sodus Bay for approximately 1,940 hours (SE=520) from 372 boat trips, and 2,126 hours (SE=393) from 958 shore trips, at night (Figures 2 and 3 and Tables 4 and 5). Boat fishing accounted for most of the open water (April through November) fishing season. Daytime boat fishing peaked in June, but substantial effort continued through November. Nighttime fishing effort was evenly divided between boat and shore fishing. Slightly more nighttime fishing occurred in June than in May or July. During the survey, ice fishing was recorded as shore fishing. The majority of the daytime shore fishing effort took place during 76 days of safe ice from December 14, 2008 to March 14, 2009. Ice fishing effort accounted for more fishing effort than daytime boat fishing.

Forty three percent of the estimated daytime boat fishing effort was directed at bass, accounting for most of the June through September effort (Table 6). Fishing for anything made up 19% of the estimated daytime boat fishing, and accounted for a large portion of the May through August effort. Yellow perch and panfish fishing accounted for about 17% and 15% of the total estimated daytime boat fishing effort, respectively. Most of the daytime boat fishing effort in April, October, and November, and all of the December daytime boat fishing effort was

directed at perch, while panfish were the most sought species from a boat during the day in May. Yellow perch fishing dominated the estimated daytime shore fishing effort (74%), accounting for most of the November, and January through March, and all of the daytime shore fishing effort in December (Table 6). Most of the ice fishing effort was directed at yellow perch and pike. Fishing for anything made up approximately 11% of the daytime shore effort and made up most of the May through September daytime shore fishing. Anglers targeting panfish accounted for 9% of the daytime shore effort, and panfish were the most sought species from shore during the day in April and June.

Fishing for bass accounted for most of the estimated nighttime boat fishing effort (57%), followed by pike (20%), anything (9%), and walleye (9%) (Table 7). The majority of the nighttime boat fishing effort in June and July was for bass. The most sought species from a boat at night during May was pike. About 30% of the total nighttime shore fishing effort was for anything (Table 7). The rest of the nighttime shore fishing effort was primarily directed at bullhead (26%), panfish (21%), and bass (19%). Most of the June and July night shore effort was for anything. Bullhead fishing dominated the May night shore effort.

Catch, Harvest, and Release

Panfish

From April 1, 2008 to March 31, 2009, an estimated 783,290 panfish were caught from Sodus Bay for a catch rate of 4.9 fish per angler hour (Table 8). It is estimated that about 30%, or 237,370 panfish were harvested (1.5 per angler hour) and 70% or 545,920, were released (3.9 per angler hour). Most of the daytime boat fishing panfish catch occurred in April, June, October, and November (Figure 4). Much of the estimated daytime boat fishing panfish harvest occurred in April and November. Most of the daytime shore fishing panfish catch occurred from April through July, while most of the ice fishing panfish catch occurred in January. The estimated ice fishing panfish harvest was nearly the same in January and February. Most of the panfish caught by nighttime boat fishing were caught in May and June, and nearly half of the May catch was creeled. Most of the estimated nighttime shore panfish catch occurred in June. Most of the May, and half of the July, nighttime shore panfish catch was creeled (Figure 4).

Most (80%) of the estimated panfish catch was yellow perch, where an estimated 619,380 were caught (3.8 per angler hour), 192,490 were harvested (1.2 per angler hour), and 426,880 were released (2.7 per angler hour, Table 8). About two thirds (68% and 64%, respectively) of the yellow perch caught (421,160) and harvested (123,630) came through the ice, with the peak catch occurring in January (Figure 5). An estimated 153,670 perch were caught (2.6 per angler hour), and 56,330 were creeled (1 per angler hour) from a boat during the daytime, primarily in April, October and November. The daytime shore fishing catch varied and was composed of yellow perch, bluegill and pumpkinseed sunfish. Rock bass and bluegill sunfish were the most caught panfish during nighttime boat fishing, primarily in May and June. Bluegill and pumpkinseed sunfish, yellow perch, bullhead, and rock bass were caught from shore during the nighttime (Figure 5). Other fish reported caught included freshwater drum (*Aplodinotus grunniens*), white bass (*Morone chrysops*), channel catfish (*Ictalurus punctatus*), and longnose gar (*Lepisosteus osseus*).

Warm Water Gamefish

From April 1, 2008 to March 31, 2009, an estimated 75,350 warm water gamefish were caught from Sodus Bay for a catch rate of 0.47 fish per angler hour (Table 9). It is estimated that only 3,260 warm water gamefish were harvested (0.02 per angler hour) and most (72,100) were

released (0.45 per angler hour). Most of the daytime boat fishing warm water gamefish catch occurred from May through July (Figure 6). The estimated daytime boat fishing warm water gamefish harvest was identical from June through October. Most of the daytime shore fishing warm water gamefish catch occurred May through July, while most of the ice fishing warm water gamefish catch occurred in January. The warm water gamefish caught by nighttime boat and shore fishing peaked in June. Very few warm water gamefish were kept during nighttime fishing (Figure 6).

The vast majority (92%) of the estimated warm water gamefish catch was comprised of largemouth bass. An estimated 69,120 were caught at a rate of 0.43 per hour, only 2,430 were kept (0.02 per angler hour), and 42,215 of the 66,690 largemouth bass released (63%) were legal sized (Table 9). Peak catches of largemouth bass came from daytime boat fishing from May through July (Figure 7). Largemouth bass also were the most caught warm water gamefish species by anglers fishing from shore and nighttime fishing. An estimated 9 largemouths were caught and illegally harvested through the ice in January. Two thousand five hundred ten smallmouth bass were estimated to have been caught (0.02 per angler hour) and nearly all (estimated 2,310) were released. Forty six percent of the released smallmouths were legal sized. Most smallmouth bass were caught during the day from a boat and were released (Figure 7). An estimated 3,620 northern pike were caught (0.02 per angler hour), primarily from a boat during the daytime in May. Five hundred and seventy northern pikes were estimated to have been harvested and 60% of the released pike were legal sized (>22 inches). Through the ice, an estimated 580 northern pike were caught, and 460 were kept. An estimated 106 walleye (<0.01 per angler hour) were caught. The walleye catch was nearly evenly divided among all of the fishing seasons. An estimated 60 walleyes (56%) were creel released and 26 of the 46 walleye released (55%) were legal sized (>18 inches). Anglers did not report catching any chain pickerel (*Esox niger*).

Cold Water Gamefish

From April 1, 2008 to March 31, 2009, an estimated 90 cold water gamefish were caught from Sodus Bay for a catch rate of <0.01 fish per angler hour (Table 10). It is estimated that 69 cold water gamefish were harvested (<0.01 per angler hour) and 21 were released (<0.01 per angler hour). The cold water gamefish were caught during daytime fishing, most through the ice (Figure 8). Those caught from November through January were creel released, and those caught in April were released.

An estimated 10 Chinook salmon, 34 rainbow trout, and 46 brown trout, were caught. All of the Chinook salmon were kept. One half of the rainbow trout were kept and most of the released rainbows were legal sized. Most of the brown trout were creel released, and the released browns were legal sized. The Chinook salmon were caught from shore in November. Most of the brown and rainbow trout were caught through the ice. A few rainbows were also caught from shore in March (Figure 9). Anglers did not report catching any coho salmon, landlocked salmon (*Salmo salar*), or lake trout (*Salvelinus namaycush*).

Directed Effort and Catch from Interviews

Most boat-caught yellow perch were caught when the angler's target was perch, and most of the other boat-caught panfish were caught when the target was panfish or anything (Table 11). Most boat-caught largemouth and smallmouth bass were caught when bass was the target, followed by panfish and anything. Northern pike were primarily caught while boat fishing for bass or pike. Almost all walleye were caught while the angler targeted walleye from a boat.

None of the trout or salmon were caught while boat fishing for salmonids. The rainbow trout was caught by a bass fisherman and the brown trout were caught while fishing for perch and pike. The directed effort boat fishing catch rate for yellow perch was an outstanding 6.6 perch per angler hour. Excellent catch rates were observed for boat anglers targeting panfish, anything, gamefish, bullhead, bass, and pike (Table 11).

From shore, most yellow perch were caught when the angler's target was perch, while most of the other shore-caught panfish were caught when the target was anything, rather than when panfish was the target (Table 11). Most bullhead were caught by shore anglers targeting them. Shore-caught largemouth bass were primarily caught by anglers targeting bass and panfish. Nearly all smallmouth bass caught from shore were caught by anglers fishing for anything. Most northern pike caught from shore were caught by anglers targeting them. All Chinook salmon and one half of the rainbow trout were caught from shore by anglers targeting salmonids. The rest of the rainbows were caught by bass or panfish anglers. Like boat fishing, the directed effort shore fishing catch rate for yellow perch was a similarly outstanding 7.1 perch per angler hour. Very impressive targeted catch rates for gamefish, pike, anything, panfish, bass, and bullhead were observed for shore anglers.

Most of the observed ice fishing effort was directed at yellow perch, and the ice fishing directed effort catch rate was an excellent 4.7 perch per angler hour (Table 11). Only one third of the pike caught through the ice were caught by anglers targeting them. The rest were caught by perch anglers.

DISCUSSION

Survey Methodology

Krueger et al. (2009) conducted concurrent access and roving interviews in the summers of 2002 and 2006 as part of the 2002-2007 Oneida Lake Creel Survey. Their comparisons of angler success rates estimated from roving and access point surveys indicated that there were no significant differences between harvest rates for either year and for catch rates in 2006. However, in 2002 there were significant differences between walleye and yellow perch catch rates. Since the majority of the interviews came from anglers whose trip originated from a public access point or marina, consideration should be given to conducting an access point survey for any future recreational fishery surveys on Sodus Bay. The cost of conducting an access point survey would be considerably less, which may outweigh the relatively small bias that would arise from not interviewing anglers whose trips originated from private residences.

Effort

The 2008-2009 estimated total effort of 161,356 angler hours from 31,030 angler trips on Sodus Bay was less than the 1996 and 2007 Statewide Angler Survey estimations of 99,600 and 93,295 angler days of fishing, respectively (Connelly et al. 1997; Connelly and Brown 2009). Total annual open water fishing pressure was estimated at 26.0 hours (7.0 trips) per acre and ice fishing pressure was estimated at 22.1 hours (4.1 trips) per acre. Daytime boat and shore fishing pressure was estimated at 17.7 hours (3.4 trips) and 7.0 hours (3.2 trips) per acre, respectively. Annual nighttime boat and shore fishing pressure was estimated at 0.6 hours (0.1 trips) and 0.6 hours (0.3 trips) per acre, respectively.

Fishing pressure in hours and trips per acre on Sodus Bay in 2008-2009 was less than Irondequoit Bay, Canadice, Bear, and Cassadaga Lakes, and much higher than that observed on Conesus, Hemlock, Oneida, and Chautauqua Lakes, and Whitney Point Reservoir, particularly ice fishing pressure (Table 12). It was estimated that 58.3 hours (14.5 trips) per acre of fishing pressure occurred during the 2007 open water season on Irondequoit Bay. Daytime boat and shore fishing pressure on Irondequoit Bay was estimated at 43.1 hours (9.6 trips) and 56.4 hours (12.3 trips) per acre, respectively. Annual nighttime boat and shore fishing pressure was estimated at 1.2 hours (0.27 trips) and 0.9 hours (0.19 trips) per acre, respectively. Fishing pressure during the 2008 ice fishing season on Irondequoit Bay was estimated at 43.2 hours (8.5 trips) per acre (Sanderson 2009). It was estimated that 17.7 angler hours per acre, or 3.6 trips per acre of fishing pressure occurred during the 2000 open water season on Conesus Lake. This effort was comprised of 15.4 angler hours, or 3.1 trips, per acre of daytime and 2.2 angler hours, or 0.5 trips, per acre of nighttime effort. Daytime boat fishing pressure was estimated at 11.8 angler hours (2.4 trips) per hour. About 7.6 angler hours or 2.0 trips, per acre occurred during the 2000-2001 winter season (Sanderson 2003).

Yellow perch received the most attention by anglers fishing Sodus Bay in 2008-2009. 82,130 angler hours, representing 51% of the total fishing effort was directed at perch. Perch fishing made up 74% of the shore fishing effort, including almost all of the ice fishing effort. Ice fishing effort for yellow perch on Sodus Bay in 2009 is similar to that estimated on Irondequoit Bay in 2008 but less than Conesus Lake during the mid 60's and 70's, when Conesus Lake was one of the most popular yellow perch ice fisheries in Western New York (Table 15). Since the surface area of Sodus Bay is larger, ice fishing pressure (21.0 angler hours, or 3.9 trips per acre) is about half of Irondequoit Bay. An estimated 13,981 anglers fished for 71,303 hours (43.3 angler hours, or 8.5 trips, per acre) for yellow perch during the winter season on Irondequoit Bay in 2008. At its peak in 1971, an estimated 28,142 anglers fished for 111,490 hours during 81 days of safe ice on Conesus Lake, or 32.6 angler hours and 8.2 trips per acre (Lane 1993). During the 1973-74 fishing season, Conesus ranked seventh among waters of the State in yellow perch harvests. Among inland waters, it was only surpassed by Oneida and Chautauqua Lakes (Brown, 1976). By comparison, in adjacent Lake Ontario, yellow perch was the third most commonly targeted species (preceded by salmonines and smallmouth bass) among open lake boat anglers in 2008, but comprised only 2.75% (1,943 boat trips) of the total fishing boat trips (Lantry and Eckert 2009). Rock bass and bluegill and pumpkinseed sunfish were targeted and caught from May to June. Two locally sponsored rock bass tournaments are held annually on Sodus Bay in May and they likely account for a large portion of the effort and catch for this species.

Fishing for bass, primarily largemouth bass, accounted for 29,700 angler hours, or 18% of the estimated annual fishing effort on Sodus Bay. Forty three percent of the daytime boat and 57% of the nighttime boat fishing effort was directed at bass. Most (63%) of the boat fishing effort from June through September was for bass. Sodus Bay was the site of at least ten locally sponsored bass fishing tournaments in 2008, which likely accounts for a large portion of this effort. Five percent of the April, May, and March effort and none of the December through February effort was directed at bass. Approximately 6% of the bass fishing effort occurred during the new catch and release season. To a certain degree, anglers are taking opportunity of the first year of the new catch and release season for bass, specifically in early spring. Northern pike were targeted during 3% of the estimated total fishing effort, or 4,825 angler hours. Walleye fishing only made up only 0.3% of the total estimated effort, or 423 angler hours.

However, anglers spent 20% and 9% of the estimated nighttime boat fishing effort targeting pike and walleye, respectively. Only 3% of the ice anglers targeted northern pike and none targeted walleye. An early fall 2006 gill net fish stock assessment survey caught an average of 3.8 walleye and 1.63 northern pike per net. This density compares favorably with similar 2005 survey data from Irondequoit Bay where 9.3 walleye and 2.2 northern pike per net were caught (Sanderson 2010), and 2001 and 2004 survey data from Conesus Lake, where 9.0 and 8.4 walleye, and 0.8 and 1.75 northern pike per net, respectively were caught (Sanderson in preparation). Walleye and northern pike are relatively abundant in Sodus Bay, but like in Irondequoit Bay, anglers aren't specifically targeting them (Sanderson 2009).

Fishing effort directed at salmonids was an estimated 778 angler hours, or 0.5% of the estimated annual fishing effort on Sodus Bay. Much of the salmonid effort was from daytime boat fishing in April, May and March suggesting that fishing in the bay is a minor alternative to fishing in Lake Ontario at a time when trout and salmon can be caught near the surface, and close to tributary mouths and in bays. The remainder of the salmonid fishing effort occurred from August through October, during the time when these species are staging near river mouths and in bays to begin their migratory spawning runs.

Catch, Harvest, and Release

Panfish

In 2008-2009, the recreational fishery on Sodus Bay was dominated by anglers seeking and catching yellow perch. Seventy two percent of the total estimated catch and 80% of the estimated harvest was yellow perch. An estimated 198,222 were caught and 68,860 were harvested during the open water season, while 421,155 were caught and 123,634 were harvested during the ice season. Data from an early fall 2006 gill net fish stock assessment survey suggests a good 2004 yellow perch year class. These fish would have been age 4 in 2008, providing an excellent fishery of approximately 10-inch total length perch. (Sanderson 2010).

The estimated April through September 2008 catch of yellow perch from adjacent Lake Ontario was 67,342 fish, the second highest estimated among the 24 years surveyed and a 51% increase compared to the 2003-2007 average catch. Harvest was estimated at 33,589 fish, the highest estimate in the data series, and 124% and 187% greater than the previous 5-year and 10-year averages, respectively (Lantry and Eckert 2009). The estimated daytime boat fishing catch and harvest of yellow perch from Sodus Bay during the same time period was 94,550 and 28,840, respectively. Lake Ontario warm water fisheries assessment data and anecdotal angler reports suggest that yellow perch populations and fisheries are relatively higher in areas not covered or poorly sampled by the Lake Ontario fishing boat survey, including embayments, tributaries adjacent to the open lake fishery, and in Lake Ontario's eastern basin (Lantry and Eckert 2009). The present survey and data from a recreational fishery survey in Irondequoit Bay (Sanderson 2009), confirms this observation is true in Irondequoit and Sodus Bays.

The overall yellow perch estimated catch rate of 3.8 fish per hour (2.27 open water, 5.68 ice) and the overall directed effort catch rate of 4.7 fish per hour (6.62 open water, 4.36 ice) is similar to that of Irondequoit Bay and exceeds the catch rates found in other nearby inland water bodies with popular yellow perch fisheries (Tables 13 and 14). In 2007-2008, the estimated overall yellow perch catch rate on Irondequoit Bay was 3.6 fish per hour (2.41 open water, 5.39 ice) and the overall directed effort catch rate was 7.3 fish per hour (8.63 open water, 5.39 ice, Sanderson 2009). In 2000-2001, the estimated open water catch rate for yellow perch on

Conesus Lake was 0.01 fish per hour and the ice fishing catch rate was 0.05 fish per hour. The ice fishing directed effort catch rate for yellow perch on Conesus Lake was 0.24 fish per hour (Sanderson 2003). The estimated open water catch rate for yellow perch on Oneida Lake in 1997 was 0.38 fish per hour and the ice season rate was 1.6 yellow perch per hour. The open water catch rate was 2.5 perch/hr and the ice season catch rate was 1.4 perch/hr for anglers targeting yellow perch (VanDeValk et al. 1999). More recently, the overall open water catch rates for yellow perch on Oneida Lake from 2002 to 2008 ranged from 0.58 to 0.07 fish per hour and the ice season catch rates ranged from 1.0 to 0.03 fish per hour. The targeted catch rates ranged from 2.99 to 0.64 and 1.22 to 0.13 per hour for open water and ice fishing, respectively (VanDeValk et al. 2005, 2006, Krueger et al. 2009). On Chautauqua Lake, McKeown and Einhouse (2002) estimated yellow perch directed catch rates of 6.98/hr during the 1998 open water season and 4.38/hr during the 1999 ice season.

The overall yellow perch estimated harvest rate of 1.2 fish per hour (0.79 open water, 1.67 ice) is also similar to that of Irondequoit Bay and exceeds the harvest rates found in nearby inland water bodies with popular yellow perch fisheries. The estimated 2007-2008 harvest rate for yellow perch on Irondequoit Bay was 1.4 fish per hour (0.85 open water, 2.12 ice, Sanderson 2009). The estimated 2000 open water harvest rate for yellow perch on Conesus Lake was 0.006 fish per hour and the 2001 ice fishing harvest rate was 0.05 fish per hour (Sanderson 2003). The estimated 2009 yellow perch ice fishing harvest and harvest rate on Sodus Bay are similar to the reported number of perch harvested and harvest rates through the ice on Irondequoit Bay in 2008 and Conesus Lake in 1965, and greater than those reported on Conesus Lake from 1971 to 2001 (Table 15, Lane 1993, Sanderson 2003, 2009). Seventy two percent of the anglers who fished for perch on Conesus Lake in 1965 were from towns greater than 20 miles from the lake (Lane 1993). Anglers may have shifted their attention to nearby Irondequoit and Sodus Bays because the perch fishery on Conesus Lake collapsed by 1988 (Abraham 1988). The estimated open water harvest rate for yellow perch on Oneida Lake in 1997 was 0.23 fish per hour and the ice season rate was 1.4 yellow perch per hour (VanDeValk et al. 1999). On Chautauqua Lake, yellow perch harvest rates of 2.4 fish/hr during the 1998 open water season and 1.01 fish/hr during the 1999 ice season were estimated (McKeown and Einhouse 2002).

Local anglers who frequently fish on Irondequoit Bay have expressed concerns about a potential decline of the yellow perch fishery from over harvest, especially during the fall boat fishery, combined with consumption by an expanding double-crested cormorant colony located on the western shore, which has grown to about 75 nests (J. Eckler and H. Kennedy, NYSDEC, personal communication). They have suggested that a reduction in the creel limit from 50 perch per day to 25 perch per day is warranted, in addition to measures controlling the cormorant colony population. Cormorants have recently begun to develop colonies on Newark and Eagle Islands near the eastern shore of Sodus Bay. Similar concerns about a potential decline of the yellow perch fishery from over harvest, combined with double-crested cormorant consumption can also be inferred on Sodus Bay. In 2008-2009, 2.2% of the anglers interviewed (72) on Sodus Bay creeled more than 25 yellow perch (Table 16). They harvested 4,489 perch (24% of the observed yellow perch harvest), or an average of 39 perch per angler. If a 25 fish limit were in place, these same anglers would have creeled 2,900 perch, “saving” 1,589 perch for an 8.5% reduction in yellow perch harvest. Since the adult yellow perch population is unknown, the angler-induced mortality of yellow perch cannot be estimated, nor can the portion the total annual mortality attributed to angler harvest be calculated. However, an 8.5% reduction in yellow perch angler harvest would likely have little effect in reducing the total annual mortality of yellow perch in Sodus Bay.

If the double crested cormorant colonies from Newark and Eagle Islands continue to expand, and further are shown to consume significant numbers of yellow perch, control of the cormorant colony is more likely than angler harvest restrictions, to reduce yellow perch mortality in Sodus Bay. In Oneida Lake, double-crested cormorants were first observed nesting in 1984 and had increased to over 360 nesting pairs by 2000. Concomitant with this increase in piscivorous birds was a decrease in the adult walleye and yellow perch populations (Rudstam et al. 2004). Cormorant consumption of adult yellow perch was similar to angler harvest, but cormorants consumed almost 10 times more age-2 yellow perch and only cormorants harvested age-1 yellow perch. Cormorants and anglers combined harvested 40% of age-1 and age-2 yellow perch and 25% of the adult yellow perch population (VanDeValk et al. 2002). VanDeValk et al. (2002) felt that the total annual mortality of adult percids had not changed since cormorant colonization, and although cormorant consumption of adult percids had little effect on harvest by anglers, consumption of subadults will reduce future angler harvest of yellow perch. Rudstam et al. (2004) analyzed a 40-yr data series that showed higher mortality of subadults for both yellow perch and walleye in the 1990s compared to the previous three decades. Cormorant diet was also investigated from 1995 to 2000 and walleye and yellow perch were a major portion of the cormorant diet. The number of subadult walleye and yellow perch consumed by cormorants suggests that the increase in subadult mortality can be explained by predation from cormorants. Mean mortality rates of adult percids attributed to cormorant predation were 1.1% per year for walleye and 7.7% per year for yellow perch. Their analysis suggests that predation by cormorants on subadult percids is a major factor contributing to the decline in both the walleye and the yellow perch populations in Oneida Lake, and other ecosystem changes are not likely explanations because the potential mechanisms involved are not consistent with auxiliary data from the lake and would not affect subadult mortality. The likely impact of bird predation on percid populations in Oneida Lake occurs because cormorants feed on larger fish that are beyond the size range where compensatory mechanisms are important (Rudstam et al. 2004).

Warm water Gamefish

The most prevalent fishing from June through September was for largemouth bass. Largemouth bass made up 8% of the total estimated catch, and 92% of the estimated warm water gamefish catch. Smallmouth bass made up only 0.3% of the total estimated catch and 3% of the estimated warm water gamefish catch. Ninety six percent of the largemouth bass and 92% of the smallmouth bass caught were released, with 63% of the largemouth bass and 46% of the smallmouth bass released being legal sized. The high release rate of bass, particularly legal sized bass, observed on Sodus Bay in 2008 is consistent with the “catch and release” ideology practiced by most bass anglers today, particularly tournament anglers. Similarly, seven angler diary keepers reported catching 431 largemouth bass on Irondequoit Bay in 1985, with only 5 bass from a single trip being harvested. Lane (1988) speculated that the average area angler had not yet perceived recent water quality improvements in Irondequoit Bay and was not inclined to creel bass from the bay. Other than the few largemouth bass illegally creeled through the ice in January, no bass were harvested during the new catch and release season from December through May. The vast majority of anglers are complying with the new bass regulation that became effective on October 1, 2006.

The daytime boat fishing catch rate of 0.83 largemouth bass per angler hour greatly exceeds the daytime boat fishing catch rate observed on Irondequoit Bay (0.22 largemouth bass per angler hour, Sanderson 2009), open water fishing on Conesus Lake (0.22 largemouth bass per hour, Sanderson 2003), and other nearby lakes in western New York (Table 13). Fishing

quality for anglers targeting bass on Sodus Bay in 2008 was excellent, as the largemouth bass directed catch rate of 1.09 per angler hour is greater than the targeted catch rate in Irondequoit Bay in 2007 (0.80 largemouth bass per hour, Sanderson 2009), both of which greatly exceed the directed effort catch rates of all size largemouth bass from selected waters in New York State (0.24 bass per hour, Green et al. 1986), Conesus Lake (0.45 largemouth bass per hour, Sanderson 2003), and other nearby western New York lakes (Table 14).

The daytime boat fishing catch rate of 0.03 smallmouth bass per angler hour is greater than catch rates recorded on Irondequoit Bay (0.01 smallmouth bass per angler hour, Sanderson 2009) and Bear Lake (0.02 smallmouth bass per hour, McKeown and Einhouse 2002), but is less than catch rates observed for open water fishing on Conesus Lake (0.06 smallmouth bass per hour, Sanderson 2003), and other nearby western New York lakes (Table 13). The smallmouth bass catch rate of 0.03 per angler hour for anglers targeting bass on Sodus Bay in 2008 is similar to the directed effort catch rate of Irondequoit Bay in 2007 (0.02 smallmouth bass per hour, Sanderson 2009), and very much less than the directed effort catch rates of all size smallmouth bass from selected waters in New York State (0.35 bass per hour, Green et al. 1986), and other western New York lakes, particularly Cassadaga Lake (0.50 smallmouth bass per hour, McKeown and Einhouse 2002), and Oneida Lake (0.32, 0.41, and 0.54 smallmouth bass per hour in 1997, 2004, and 2005, respectively; VanDeValk et al. 1999, VanDeValk et al. 2005, 2006, Krueger et al. 2009) (Table 14). Many boat trips seeking smallmouth bass originate from the Village of Sodus Point boat launch and marinas on Sodus Bay. However, most of these trips head out onto Lake Ontario to seek what once was a high quality smallmouth bass fishery in this part of the lake. Recent creel surveys have shown that Lake Ontario smallmouth bass fishing quality has declined in recent years (Lantry and Eckert 2009). It appears that smallmouth bass fishermen have not chosen Sodus Bay as an alternative fishing location to Lake Ontario, perhaps due to low numbers caught in past fisheries surveys, low angler catch rates, and the close proximity of high quality smallmouth bass fisheries in other nearby inland lakes.

Northern pike made up only 0.42% of the total catch, but was 4.8% of the warm water gamefish catch. The directed effort catch rate for northern pike was 0.16 pike per angler hour, slightly less than observed on Irondequoit Bay in 2008 (0.22 pike/hr, Sanderson 2009). The high release rate of legal sized northern pike during the open water season suggests that Sodus Bay open water anglers value northern pike more as a sport fish, rather than as a food fish. However, ice anglers value northern pike as table fare, as 80% of the northern pike caught through the ice were creeled.

Walleye made up only 0.01% of the total catch, and was only 0.14% of the warm water gamefish catch. The overall catch rate for nighttime boat fishing was 0.01 walleye per angler hour, but the catch rate for anglers targeting walleye was 0.11 per angler hour. The 2008 Sodus Bay nighttime boat fishing walleye catch rate is less than the overall catch rate for nighttime boat fishing on Irondequoit Bay in 2007 (0.07 walleye per angler hour). The catch rate for anglers targeting walleye on Irondequoit Bay in 2007 was only 0.02 per angler hour, but most walleye were caught by anglers targeting gamefish (Sanderson 2009). The 2008 Sodus Bay nighttime boat fishing walleye catch rate is also less than the 2000 Conesus Lake nighttime open water season catch rate for walleye (0.03/hour, Sanderson 2003) and the Oneida Lake nighttime open water season catch rate in 1997 (0.25 walleye/hr, VanDeValk et al. 1999). Overall open water catch rates for walleye on Sodus Bay were lower than most western and central New York Waters with popular walleye fisheries (Table 13). Walleye catch rates in Oneida Lake from 2002-2007 ranged from 0.19 to 0.63 (Krueger et al. 2009) and was 0.18 walleye per hour in 1997

(VanDeValk 1999). The directed effort catch rate for walleye during the 2008 open water season in Sodus Bay was greater than Conesus Lake in 2000 (0.05 walleye per hour), and Hemlock Lake in 2005. Oneida Lake from 2002-2007, and 1997 (0.25-0.75, and 0.21 walleye per hour, respectively; Krueger et al. 2009, VanDeValk et al. 1999), Chautauqua Lake in 1998 (0.33 walleye per hour, McKeown and Einhouse 2000), and Whitney Point Reservoir in 1999 (0.49 walleye per hour, Bishop and Lemon 2003) had higher directed effort walleye catch rates than Sodus Bay in 2008 (Table 14). Festa et al. (1987) describes walleye catch rates over 0.20/hr for anglers targeting walleye as above average for North American lakes. The 2008 Sodus Bay directed effort walleye catch rate is half of this benchmark. Despite a high relative abundance index for walleye in Sodus Bay (Sanderson 2010), few anglers target them, but those anglers that do target walleyes, catch them at a fair rate. Perhaps potential walleye anglers are unaware that a potentially good fishery exists in Sodus Bay, and/or are targeting bass, northern pike, or perch due to outstanding fisheries for those species. Although walleye were caught by perch anglers through the ice on Sodus Bay in 2009, like Conesus Lake in 2001 and Irondequoit Bay in 2008, no walleye were caught through the ice by anglers targeting them, while considerable walleye ice fisheries exist on Oneida and Chautauqua Lakes, and Whitney Point Reservoir. One nearshore fish community objective for Lake Ontario is the maintenance of existing walleye populations and expansion of walleye populations into favorable habitats based on natural reproduction and the wise use of stocked fish (Stewart et al. 1999). Since walleyes are becoming established in Sodus Bay and walleye fingerling stocking has been sporadic, maintenance of the population through biannual stocking is reasonable until it is ascertained that the population can be maintained via natural reproduction.

Cold Water Gamefish

Cold water game fish were a minor component of the catch, accounting for only 0.01% of the total catch. Brown trout and rainbow trout made up 51% and 37% of the estimated coldwater game fish catch, respectively. Most of the brown and rainbow trout catch and brown trout harvest occurred during the ice fishing season. While nearly all of the brown trout and Chinook salmon were harvested, only about one half of the rainbows were kept, and most of the released rainbows were legal sized. Although the trout and salmon regulations for Lake Ontario apply to Sodus Bay, anglers fishing for rainbow trout in Sodus Bay appear to be voluntarily complying with a one rainbow trout creel limit that applies to Lake Ontario tributaries. Like smallmouth bass trips, many boat trips seeking trout and salmon originate from the Village of Sodus Point boat launch and marinas on Sodus Bay. Nearly all of these trips head out onto Lake Ontario to take advantage of the high quality salmonid fishery that existed in this part of the lake in 2008.

RECOMMENDATIONS

1. Continue existing fishing regulations for species, seasons, size and creel limits, and fishing methods.
2. Continue biannual stocking of 74,000 walleye fingerlings in accordance with current statewide walleye management plan and Lake Ontario nearshore fish community objectives until it is determined that natural reproduction can sustain the population.
3. Conduct another creel survey in 10 years to track long term changes in the fishery due to walleye fingerling stocking, catch and release bass fishing, cormorant predation, invasive species and diseases, and angler exploitation. A roving-access or access-access survey design (Pollock,

et al 1994) should be conducted. If night surveys are conducted, only conduct night surveys from May through July.

4. Begin a cooperating angler diary program to monitor annual trends in effort, catch, harvest, overall catch and harvest rates, directed effort catch and harvest rates, and size quality of selected species, as regional program plans allow.
5. Provide written materials that convey to the public that the conclusions of this creel survey suggest that implementing a 25 yellow perch per day creel limit on Sodus Bay would not likely result in significant reduction in overall yellow perch mortality.
6. Prepare written (i.e., press release, *Conservationist* article, etc.) and web site materials using information from the results of this survey, and the 2005 fish stock assessment survey, to generate more interest in the northern pike and walleye fisheries.
7. Continue to research the impacts of double crested cormorants on Irondequoit Bay fish populations, so inferences can be made about their effects on the Sodus Bay fish populations. Collaborate with the DEC Region 8 Wildlife Unit and the United States Fish and Wildlife Service (USFWS) to develop and implement a double-crested cormorant control plan in accordance with the existing federal public resource depredation order (50 CFR 21.48).

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Figure 1. Map of Sodus Bay showing roving survey grids (1-8) and access survey sites (9-16).

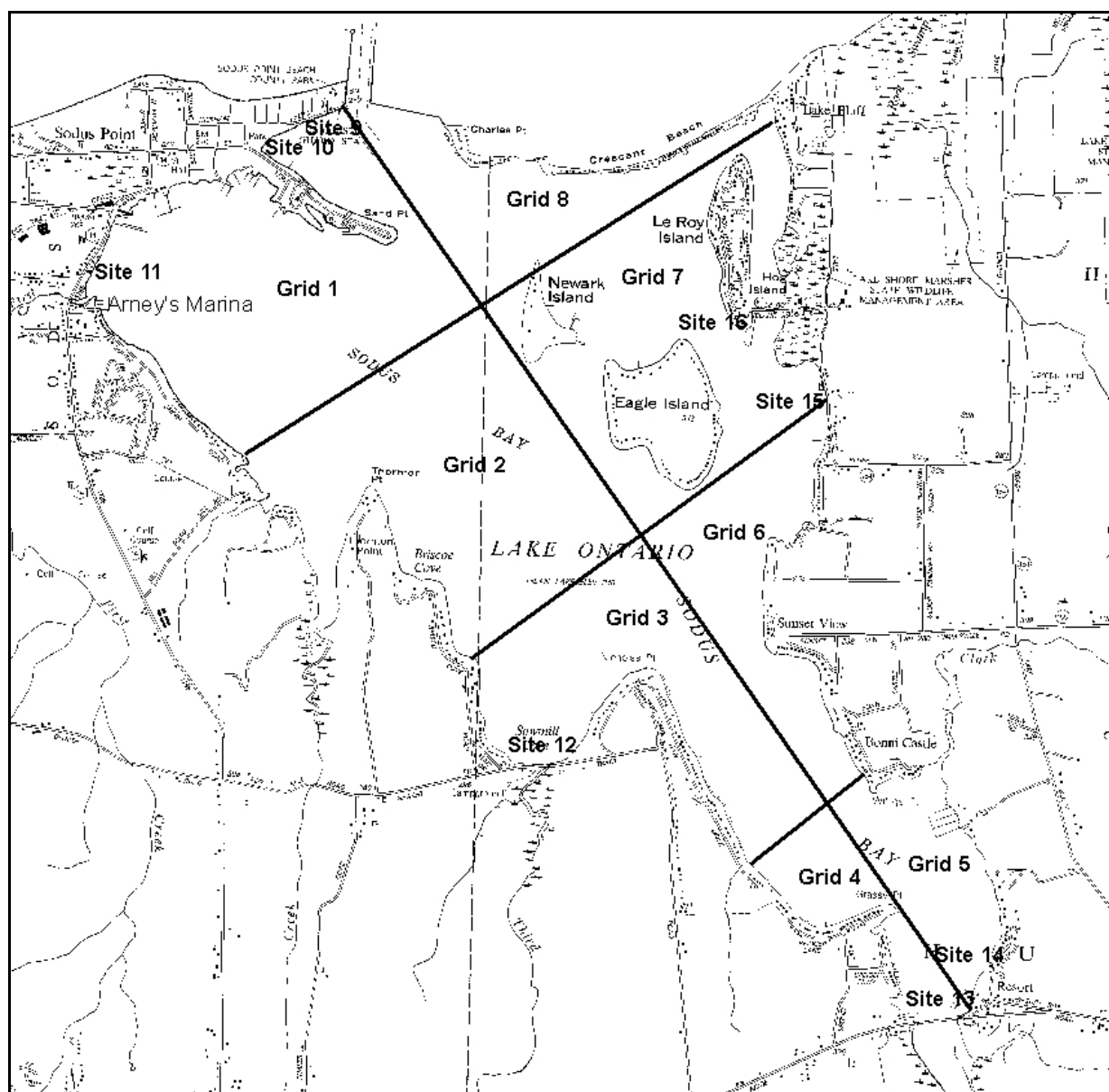


Figure 2. Estimated daytime fishing effort (angler hours) on Sodus Bay from April 1, 2008 to March 31, 2009.

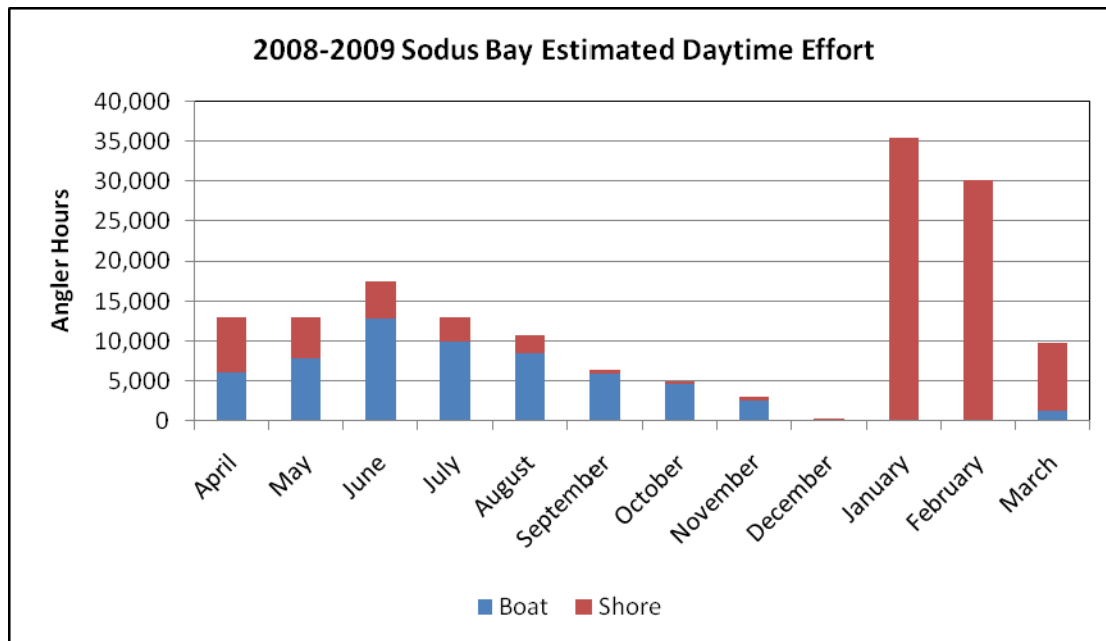


Figure 3. Estimated nighttime fishing effort (angler hours) on Sodus Bay from May 1, 2008 to July 30, 2008.

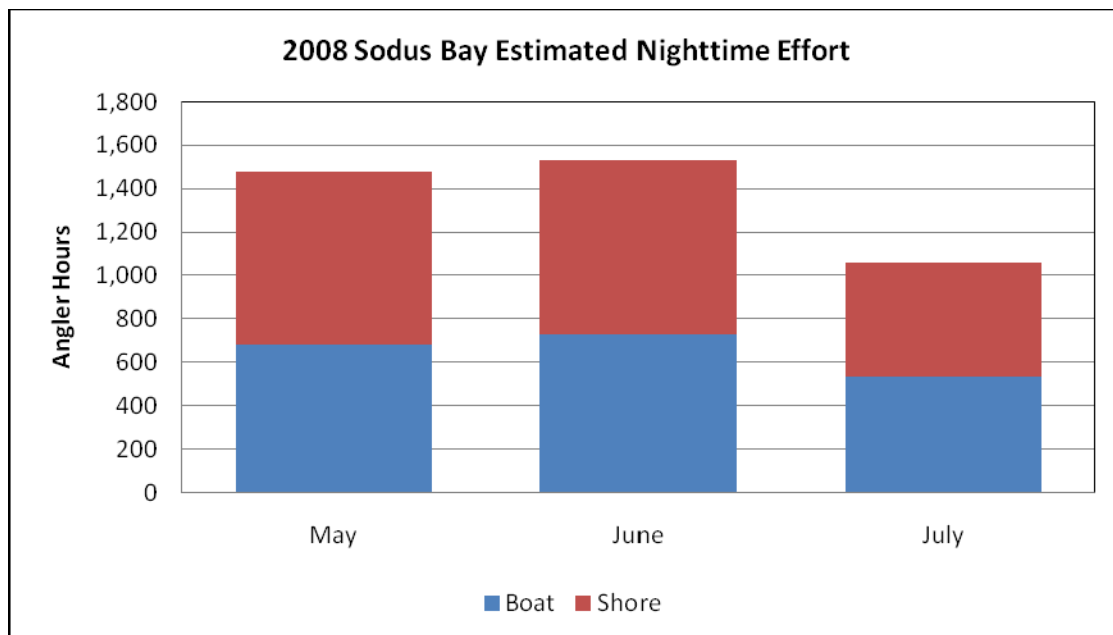


Figure 4. Estimated panfish catch on Sodus Bay from 4/1/2008 to 3/31/2009.

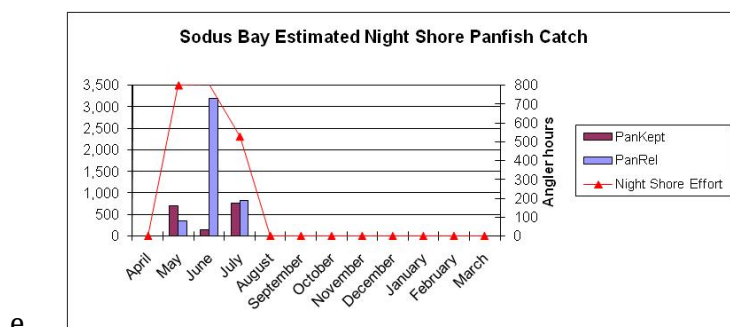
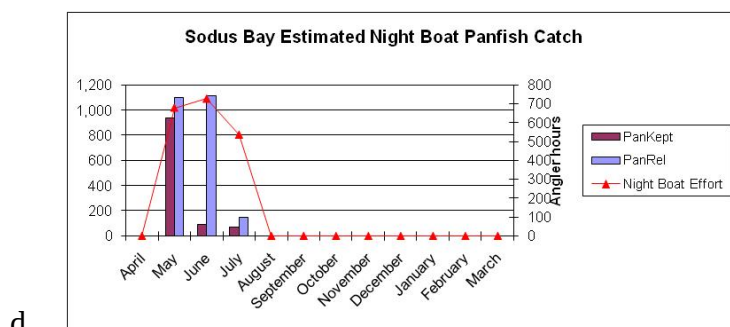
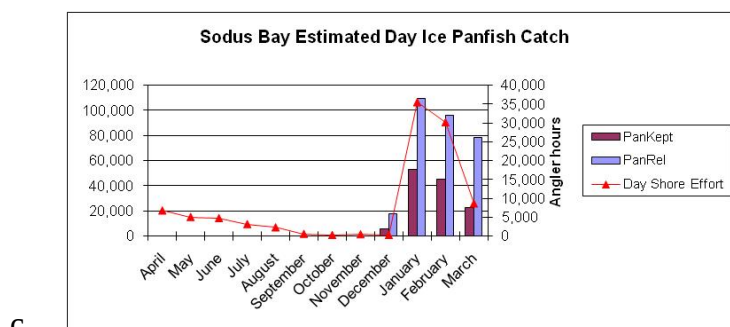
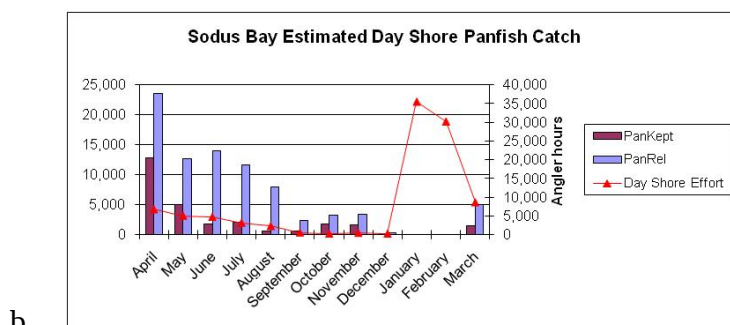
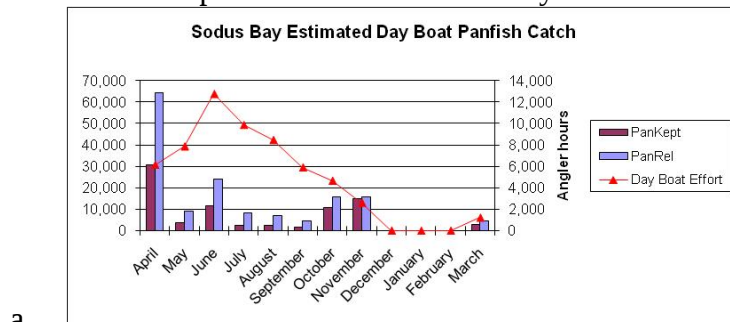


Figure 5. Estimated panfish catch on Sodus Bay from 4/1/2008 to 3/31/2009.

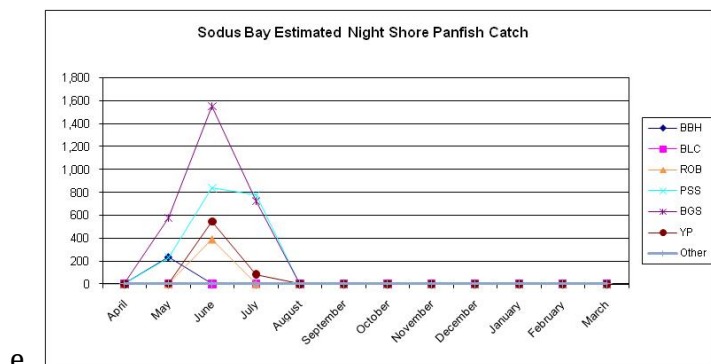
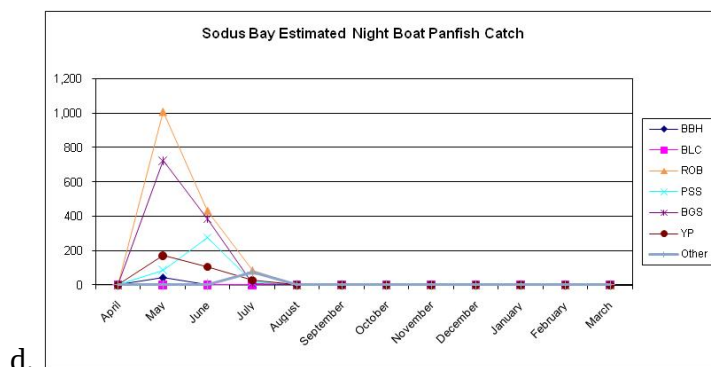
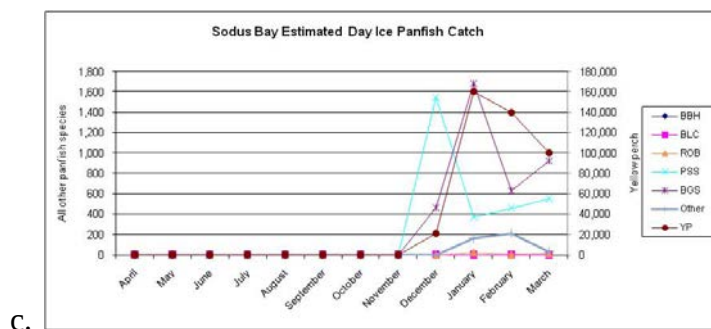
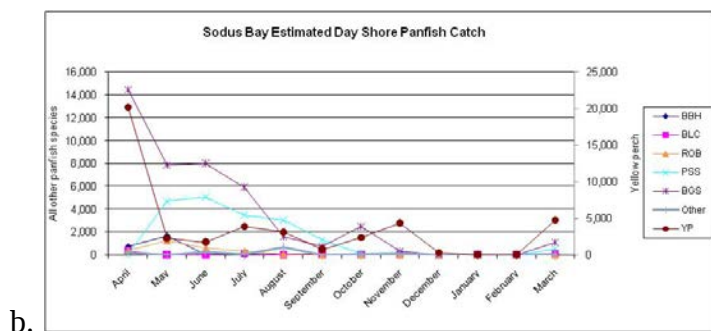
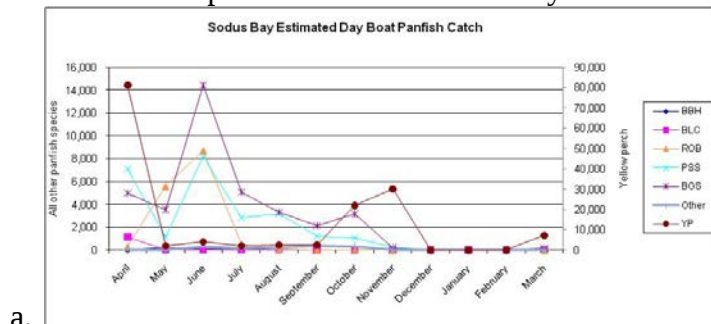


Figure 6. Estimated warm water game fish catch on Sodus Bay from 4/1/2008 to 3/31/2009.

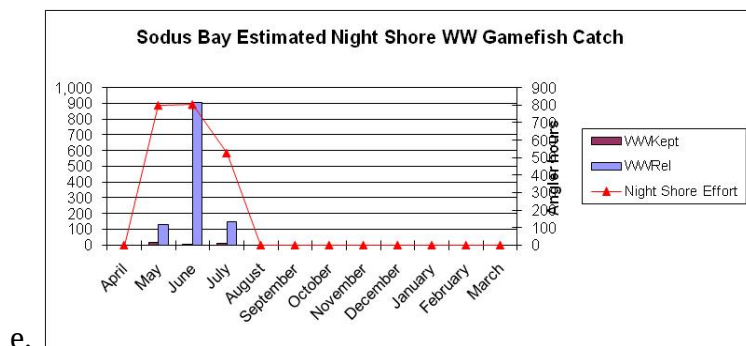
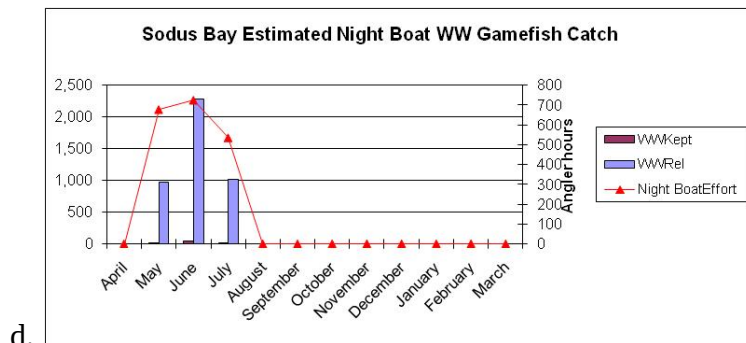
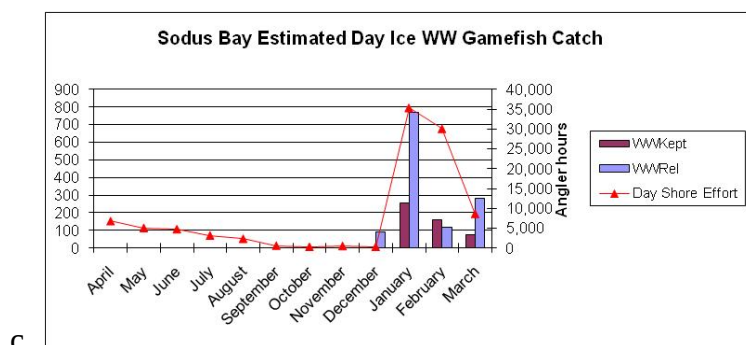
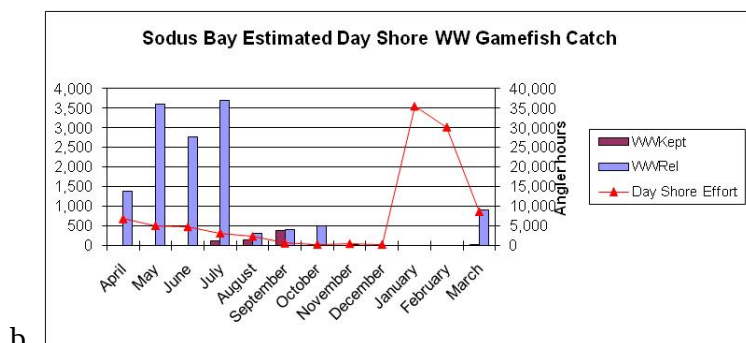
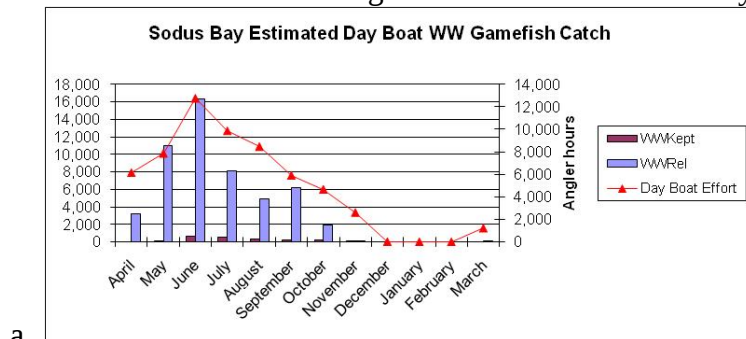


Figure 7. Estimated warm water game fish catch on Sodus Bay from 4/1/2008 to 3/31/2009.

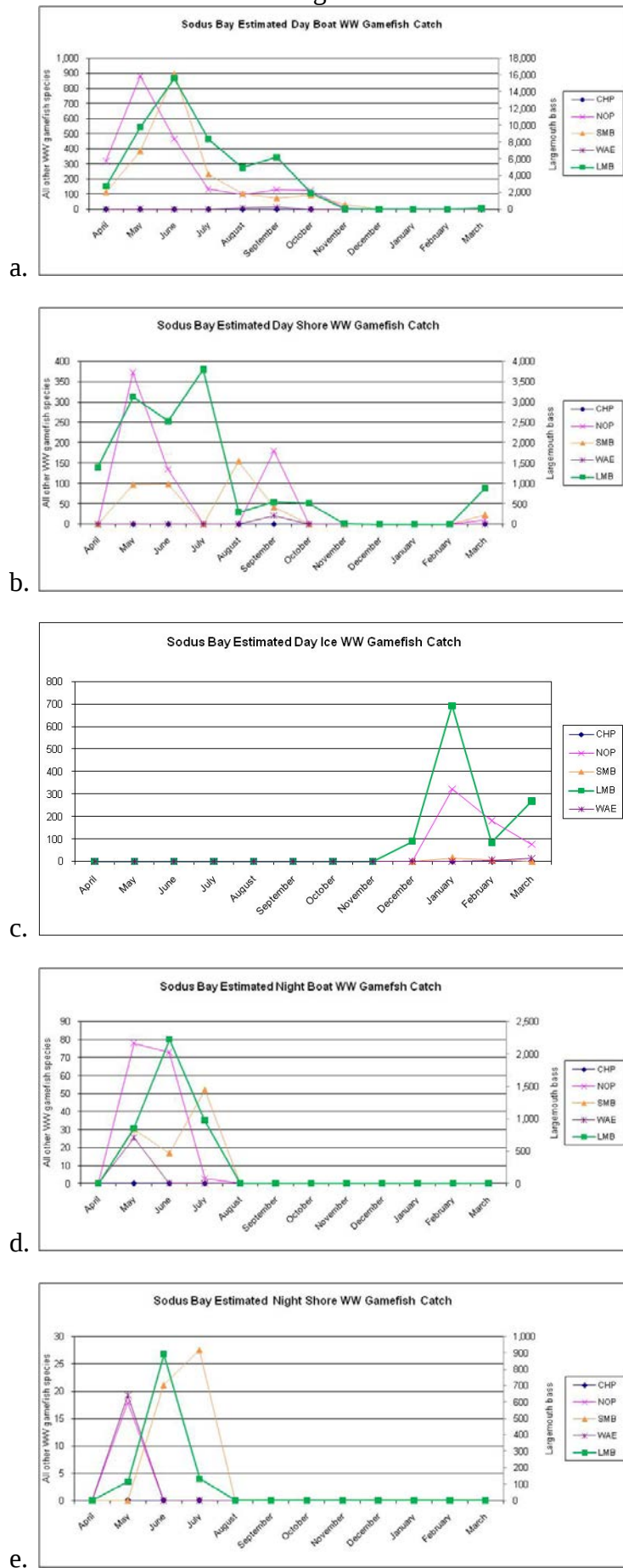
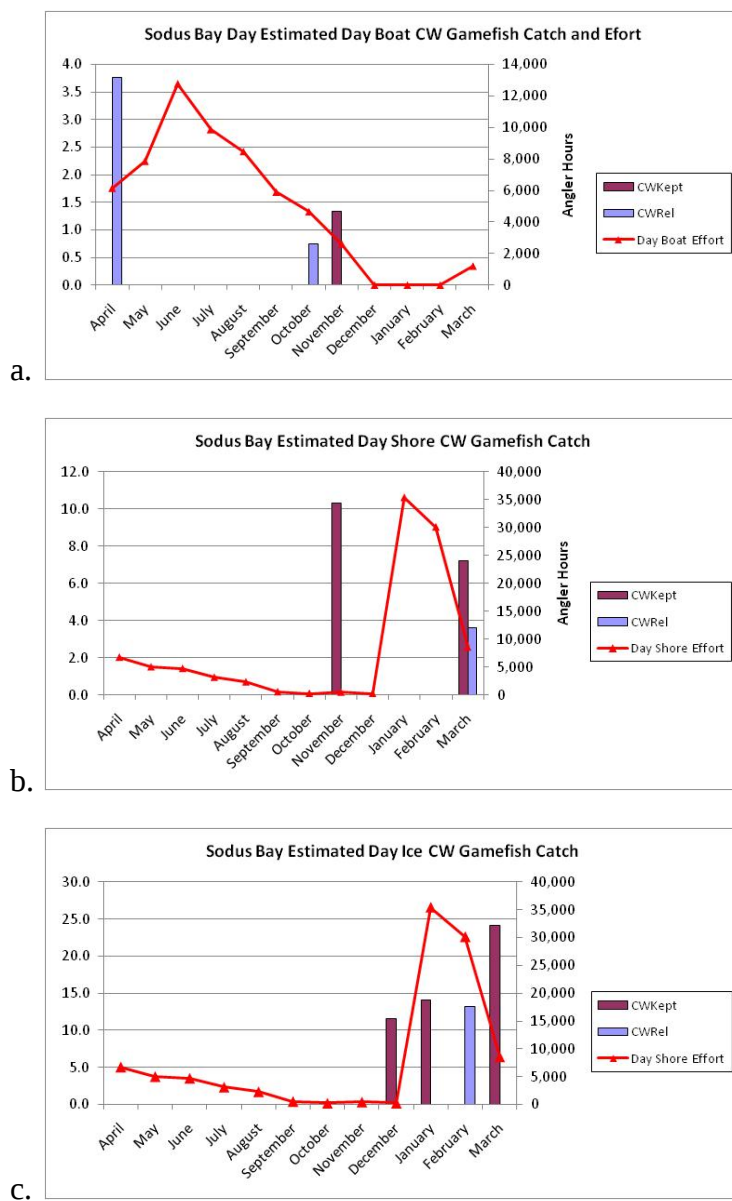
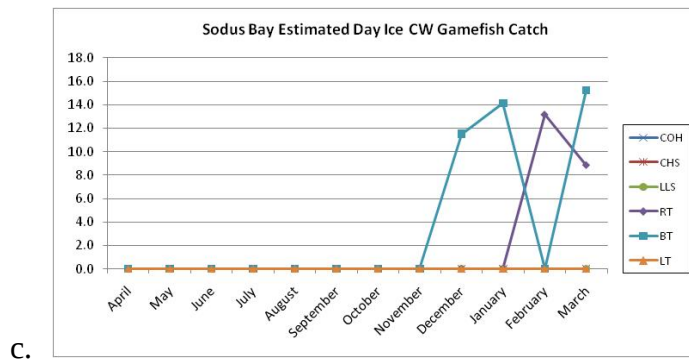
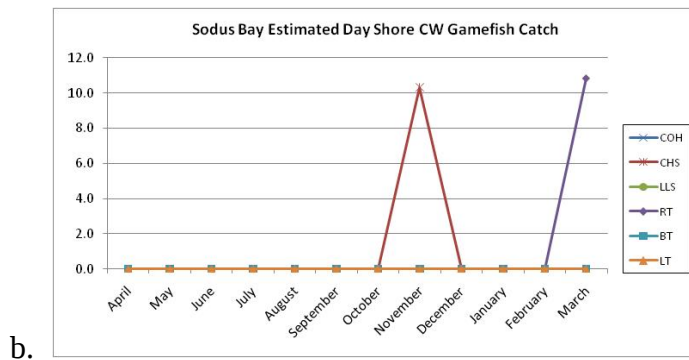
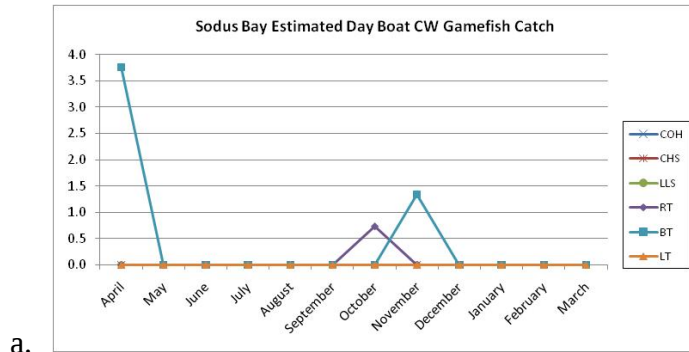


Figure 8. Estimated cold water game fish catch on Sodus Bay from 4/1/2008 to 3/31/2009.



No cold water game fish were caught at night.

Figure 9. Estimated cold water game fish catch on Sodus Bay from 4/1/2008 to 3/31/2009.



No cold water game fish were caught at night.

Table 1. Summary of Sodus Bay interviews from April 1, 2008 to March 31, 2009.

	Boat	Shore	Ice	Total
Interviews	1,989	501	778	3,268
Anglers Interviewed	4,281	895	1,797	6,973
Angler Hours	13,470.5	1,754.6	9,762.6	24,987.7
Avg Party size	2.2	1.8	2.3	2.1
Avg Trip Length*	5.2	2.2	5.4	5.2

*From complete trip interviews

Table 2. Interview location and type, fishing method, trip origin, and target of Sodus Bay interviews from April 1, 2008 to March 31, 2009.

	# Interviews	Percent
Type/Location		
Complete Boat	319	10%
Complete Ice	734	22%
Complete Shore	72	2%
Incomplete Boat	1670	51%
Incomplete Ice	44	1%
Incomplete Shore	429	13%
Total	3268	100%
Method		
Unknown	1	0%
Cast	767	23%
Cast/Drift	523	16%
Cast/Troll	137	4%
Drift	15	0%
Fly	4	0%
Jig	824	25%
Still	376	12%
Still/Cast	559	17%
Still/Drift	10	0%
Still/Troll	4	0%
Tip up	19	1%
Troll	25	1%
Troll/Drift	4	0%
Total	3268	100%
Origin		
Unknown	1	0%
Marina	661	20%
Private	652	20%
Public	1954	60%
Total	3268	100%
Target		
Anything	586	18%
Bass	1022	31%
Bullhead	35	1%
Gamefish	7	0%
Panfish	426	13%
Perch	1053	32%
Pike	102	3%
Salmonids	18	1%
Walleye	19	1%
Total	3268	100%

Table 3. Angler residence of Sodus Bay interviews from April 1, 2008 to March 31, 2009.

	# Interviews	Percent
Residence		
Out of state	121	4%
Allegany	1	0%
Broome	8	0%
Cattaraugus	2	0%
Cayuga	95	3%
Chautauqua	3	0%
Chemung	18	1%
Chenango	5	0%
Cortland	8	0%
Dutchess	1	0%
Erie	35	1%
Franklin	1	0%
Genesee	9	0%
Hamilton	1	0%
Jefferson	1	0%
Kings	2	0%
Lewis	1	0%
Livingston	16	0%
Madison	11	0%
Monroe	1038	32%
Niagara	14	0%
Oneida	5	0%
Onondaga	126	4%
Ontario	115	4%
Orange	1	0%
Orleans	27	1%
Oswego	150	5%
Otsego	3	0%
Putnam	2	0%
Queens	1	0%
Rockland	1	0%
Schenectady	3	0%
Schuyler	4	0%
Seneca	48	1%
St. Lawrence	1	0%
Steuben	16	0%
Suffolk	1	0%
Sullivan	3	0%
Tioga	6	0%
Tompkins	26	1%
Ulster	1	0%
Wayne	1316	40%
Westchester	2	0%
Wyoming	9	0%
Yates	10	0%
Total	3268	100%
NYS counties	44	

Table 4. Estimated daytime fishing effort (angler hours) on Sodus Bay from April 1, 2008 to March 31, 2009.

Month	WD Day		WE Day		WD Day		WE Day		Day time					
	Boat	SE	Boat	SE	Shore	SE	Shore	SE	Boat	SE	Shore	SE	Total	SE
April	3,311.0	818.5	2,842.0	959.3	3,388.0	865.3	3,381.0	557.6	6,153.0	1,261.0	6,769.0	1,029.4	12,922.0	1,627.8
May	3,158.6	1,025.7	4,712.7	1,471.7	1,744.3	680.2	3,295.2	740.0	7,871.3	1,793.9	5,039.5	1,005.1	12,910.8	2,056.3
June	6,727.1	1,132.2	6,048.0	1,425.9	2,659.6	440.4	2,080.0	461.4	12,775.1	1,820.8	4,739.6	637.9	17,514.7	1,929.3
July	6,051.6	1,117.7	3,824.0	543.3	2,044.4	308.9	1,104.0	208.0	9,875.6	1,242.8	3,148.4	372.4	13,024.0	1,297.4
August	3,710.0	614.0	4,766.7	868.5	1,365.0	243.4	950.0	131.1	8,476.7	1,063.6	2,315.0	276.5	10,791.7	1,098.9
September	2,387.0	751.6	3,521.8	623.1	269.5	111.8	298.7	112.0	5,908.8	976.3	568.2	158.2	6,476.9	989.0
October	2,760.0	1,072.1	1,906.3	392.2	179.4	94.4	82.3	29.1	4,666.3	1,141.6	261.7	98.8	4,928.0	1,145.8
November	1,980.0	844.6	630.0	221.9	150.0	67.1	322.5	75.2	2,610.0	873.2	472.5	100.7	3,082.5	879.0
December	0.0	0.0	10.0	10.0	178.9	165.0	95.0	50.7	10.0	10.0	273.9	172.6	283.9	172.9
January	0.0	0.0	0.0	0.0	19,360.0	4,893.0	16,055.0	2,611.2	0.0	0.0	35,415.0	5,546.1	35,415.0	5,546.1
February	0.0	0.0	0.0	0.0	12,087.5	2,526.2	18,035.0	3,150.2	0.0	0.0	30,122.5	4,038.0	30,122.5	4,038.0
March	381.3	202.2	832.0	482.6	2,780.6	1,785.3	5,824.0	2,421.5	1,213.3	523.2	8,604.6	3,008.4	9,817.9	3,053.6
Total	30,466.6	2,664.3	29,093.5	2,644.4	46,207.1	5,926.5	51,522.7	4,874.3	59,560.0	3,753.9	97,729.8	7,673.5	157,289.8	8,542.5

Table 5. Estimated nighttime fishing effort (angler hours) on Sodus Bay from May 1 to July 31, 2008.

Month	WD Night		WE Night		WD Night		WE Night		Night time					
	Boat	SE	Boat	SE	Shore	SE	Shore	SE	Boat	SE	Shore	SE	Total	SE
May	495.0	374.8	183.6	40.4	528.0	192.4	270.0	102.8	678.6	377.0	798.0	218.2	1,476.6	435.6
June	429.0	301.8	297.0	71.4	627.0	179.7	175.5	76.8	726.0	310.2	802.5	195.4	1,528.5	366.6
July	379.5	142.2	156.0	109.8	465.8	260.3	60.0	25.0	535.5	179.7	525.8	261.5	1,061.3	317.3
Total	1,303.5	501.8	636.6	137.1	1,620.8	370.2	505.5	130.7	1,940.1	520.2	2,126.3	392.6	4,066.4	651.7

Table 6. Estimated daytime fishing effort (angler hours) by target and month on Sodus Bay from April 1, 2008 to March 31, 2009.

Boat Fishing														
Target	April	May	June	July	August	September	October	November	December	January	February	March	Total	%
Anything	681.1	2,331.3	3,334.3	2,336.7	1,965.1	441.0	400.6	0.0	0.0	0.0	0.0	12.8	11,502.9	19.3%
Bass	268.8	597.7	6,051.8	6,690.3	5,489.4	4,942.5	1,324.1	12.9	0.0	0.0	0.0	58.7	25,436.2	42.7%
Bullhead	0.0	15.1	49.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.9	0.1%
Gamefish	199.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	199.1	0.3%
Panfish	1,058.9	3,222.9	2,823.9	762.2	719.4	112.8	226.8	0.0	0.0	0.0	0.0	262.7	9,189.6	15.4%
Perch	3,440.1	23.8	24.9	25.2	117.1	352.1	2,469.8	2,597.1	10.0	0.0	0.0	868.7	9,928.8	16.7%
Pike	214.3	1,436.8	472.3	51.0	69.2	34.1	179.1	0.0	0.0	0.0	0.0	0.0	2,456.8	4.1%
Salmonids	290.7	121.5	0.0	0.0	102.5	5.0	65.9	0.0	0.0	0.0	0.0	10.4	596.1	1.0%
Walleye	0.0	122.2	18.0	10.2	13.9	21.3	0.0	0.0	0.0	0.0	0.0	0.0	185.5	0.3%
Total	6,153.0	7,871.3	12,775.1	9,875.6	8,476.7	5,908.8	4,666.3	2,610.0	10.0	0.0	0.0	1,213.3	59,560.0	100.0%
Percent	10.3%	13.2%	21.4%	16.6%	14.2%	9.9%	7.8%	4.4%	0.0%	0.0%	0.0%	2.0%	100.0%	
Shore Fishing														
Target	April	May	June	July	August	September	October	November	December	January	February	March	Totals	%
Anything	1,594.2	2,946.3	1,252.5	1,992.0	1,593.3	487.9	119.5	63.9	0.0	0.0	0.0	325.9	10,375.5	10.6%
Bass	0.0	549.8	865.4	860.4	437.5	18.0	0.0	2.8	0.0	0.0	0.0	27.5	2,761.4	2.8%
Bullhead	601.9	413.2	0.0	32.1	49.9	0.0	0.0	0.0	0.0	0.0	0.0	24.8	1,121.9	1.1%
Gamefish	84.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	89.5	0.1%
Panfish	3,220.0	1,093.6	2,572.1	245.9	234.3	62.3	77.5	10.9	0.0	0.0	0.0	1,535.2	9,051.8	9.3%
Perch	1,268.5	0.0	15.5	18.0	0.0	0.0	64.7	367.1	273.9	34,456.5	29,256.0	6,480.4	72,200.6	73.9%
Pike	0.0	36.7	34.0	0.0	0.0	0.0	0.0	0.0	0.0	958.5	866.5	78.9	1,974.5	2.0%
Salmonids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.8	0.0	0.0	0.0	126.7	154.5	0.2%
Walleye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
Totals	6,769.0	5,039.5	4,739.6	3,148.4	2,315.0	568.2	261.7	472.5	273.9	35,415.0	30,122.5	8,604.6	97,729.8	100.0%
Percent	6.9%	5.2%	4.8%	3.2%	2.4%	0.6%	0.3%	0.5%	0.3%	36.2%	30.8%	8.8%	100.0%	
Grand Total														
Grand Total	12,922.0	12,910.8	17,514.7	13,024.0	10,791.7	6,476.9	4,928.0	3,082.5	283.9	35,415.0	30,122.5	9,817.9	157,289.8	
Percent	8.2%	8.2%	11.1%	8.3%	6.9%	4.1%	3.1%	2.0%	0.2%	22.5%	19.2%	6.2%	100.0%	

Table 7. Estimated nighttime fishing effort (angler hours) by target and month on Sodus Bay from May 1 to July 31, 2008.

Boat Fishing					
Target	May	June	July	Totals	%
Anything	23.1	131.7	26.1	180.9	9.3%
Bass	150.0	456.2	491.0	1097.3	56.6%
Bullhead	0.0	0.0	0.0	0.0	0.0%
Gamefish	0.0	0.0	0.0	0.0	0.0%
Panfish	71.2	15.7	14.8	101.6	5.2%
Perch	0.0	0.0	0.0	0.0	0.0%
Pike	299.4	94.2	0.0	393.7	20.3%
Salmonids	0.0	0.0	0.0	0.0	0.0%
Walleye	134.8	28.1	3.7	166.6	8.6%
Totals	678.6	726.0	535.5	1,940.1	100.0%
Percent	35.0%	37.4%	27.6%	100.0%	
Shore Fishing					
Target	May	June	July	Totals	%
Anything	19.6	378.8	236.3	634.6	29.8%
Bass	30.5	179.0	193.0	402.5	18.9%
Bullhead	551.6	0.0	0.0	551.6	25.9%
Gamefish	0.0	0.0	0.0	0.0	0.0%
Panfish	98.3	244.7	96.5	439.5	20.7%
Perch	0.0	0.0	0.0	0.0	0.0%
Pike	0.0	0.0	0.0	0.0	0.0%
Salmonids	27.2	0.0	0.0	27.2	1.3%
Walleye	70.9	0.0	0.0	70.9	3.3%
Totals	798.0	802.5	525.8	2,126.3	100.0%
Percent	37.5%	37.7%	24.7%	100.0%	
Grand Total	1,476.6	1,528.5	1,061.3	4,066.4	
Percent	36.3%	37.6%	26.1%	100.0%	

Table 8. Estimated panfish catch, harvest, and release on Sodus Bay from 4/1/2008 to 3/31/2009.

Species	Catch		Harvest		Release		Legal Release		Sublegal Release	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Daytime Boat Fishing										
Brown bullhead	615.8	0.01	432.3	0.01	183.5	0.00	183.5	0.00	0.0	0.00
Black crappie	1,266.1	0.02	211.5	0.00	1,054.6	0.02	13.8	0.00	1,040.8	0.02
Rock bass	15,283.7	0.26	6,115.5	0.10	9,168.2	0.15	9,168.2	0.15	0.0	0.00
Pumpkinseed	24,922.1	0.42	5,142.3	0.09	19,779.8	0.33	19,779.8	0.33	0.0	0.00
Bluegill	37,005.7	0.62	12,032.6	0.20	24,973.0	0.42	24,973.0	0.42	0.0	0.00
Yellow perch	153,665.8	2.58	56,326.3	0.95	97,339.5	1.63	97,339.5	1.63	0.0	0.00
Other	1,508.5	0.03	448.9	0.01	1,059.6	0.02	1,059.6	0.02	0.0	0.00
Total	234,267.7	3.93	80,709.4	1.36	153,558.3	2.58	152,517.5	2.56	1,040.8	0.02
Effort	59,560.0									
Daytime Shore Fishing										
Brown bullhead	2,521.2	0.11	1,982.6	0.08	538.6	0.02	538.6	0.02	0.0	0.00
Black crappie	581.5	0.02	386.1	0.02	195.4	0.01	0.0	0.00	195.4	0.01
Rock bass	2,577.2	0.11	941.8	0.04	1,635.4	0.07	1,635.4	0.07	0.0	0.00
Pumpkinseed	18,375.3	0.78	1,968.2	0.08	16,407.1	0.70	16,407.1	0.70	0.0	0.00
Bluegill	42,442.5	1.80	9,577.3	0.41	32,865.3	1.39	32,865.3	1.39	0.0	0.00
Yellow perch	43,622.5	1.85	12,509.3	0.53	31,113.1	1.32	31,113.1	1.32	0.0	0.00
Other	1,273.5	0.05	315.4	0.01	958.0	0.04	958.0	0.04	0.0	0.00
Total	111,393.7	4.72	27,680.8	1.17	83,713.0	3.55	83,517.6	3.54	195.4	0.01
Effort	23,587.8									
Daytime Ice Fishing										
Brown bullhead	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Black crappie	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Rock bass	42.1	0.00	15.3	0.00	26.8	0.00	26.8	0.00	0.0	0.00
Pumpkinseed	2,935.0	0.04	1,071.5	0.01	1,863.5	0.03	1,863.5	0.03	0.0	0.00
Bluegill	3,694.3	0.05	1,558.2	0.02	2,136.1	0.03	2,136.1	0.03	0.0	0.00
Yellow perch	421,154.8	5.68	123,633.6	1.67	297,521.2	4.01	297,521.2	4.01	0.0	0.00
Other	400.0	0.01	18.6	0.00	381.4	0.01	381.4	0.01	0.0	0.00
Total	428,226.1	5.78	126,297.1	1.70	301,929.1	4.07	301,929.1	4.07	0.0	0.00
Effort	74,142.1									
Nighttime Boat Fishing										
Brown bullhead	42.2	0.02	37.0	0.02	5.1	0.00	5.1	0.00	0.0	0.00
Black crappie	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Rock bass	1,528.9	0.79	708.7	0.37	820.2	0.42	820.2	0.42	0.0	0.00
Pumpkinseed	380.2	0.20	71.5	0.04	308.6	0.16	308.6	0.16	0.0	0.00
Bluegill	1,117.4	0.58	188.7	0.10	928.6	0.48	928.6	0.48	0.0	0.00
Yellow perch	303.9	0.16	23.2	0.01	280.7	0.14	280.7	0.14	0.0	0.00
Other	79.6	0.04	62.1	0.03	17.5	0.01	17.5	0.01	0.0	0.00
Total	3,452.1	1.78	1,091.3	0.56	2,360.9	1.22	2,360.9	1.22	0.0	0.00
Effort	1,940.1									
Nighttime Shore Fishing										
Brown bullhead	232.8	0.11	192.7	0.09	40.1	0.02	40.1	0.02	0.0	0.00
Black crappie	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Rock bass	391.5	0.18	39.9	0.02	351.5	0.17	351.5	0.17	0.0	0.00
Pumpkinseed	1,844.2	0.87	680.8	0.32	1,163.4	0.55	1,163.4	0.55	0.0	0.00
Bluegill	2,853.1	1.34	682.4	0.32	2,170.8	1.02	2,170.8	1.02	0.0	0.00
Yellow perch	630.0	0.30	0.0	0.00	630.0	0.30	630.0	0.30	0.0	0.00
Other	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Total	5,951.5	2.80	1,595.7	0.75	4,355.8	2.05	4,355.8	2.05	0.0	0.00
Effort	2,126.3									
Total Fishing										
Brown bullhead	3,412.0	0.02	2,644.6	0.02	767.4	0.00	767.4	0.00	0.0	0.00
Black crappie	1,847.6	0.01	597.6	0.00	1,250.0	0.01	13.8	0.00	1,236.2	0.01
Rock bass	19,823.4	0.12	7,821.2	0.05	12,002.2	0.07	12,002.2	0.07	0.0	0.00
Pumpkinseed	48,456.7	0.30	8,934.2	0.06	39,522.5	0.24	39,522.5	0.24	0.0	0.00
Bluegill	87,113.0	0.54	24,039.2	0.15	63,073.8	0.39	63,073.8	0.39	0.0	0.00
Yellow perch	619,377.0	3.84	192,492.4	1.19	426,884.5	2.65	426,884.5	2.65	0.0	0.00
Other	3,261.6	0.02	845.0	0.01	2,416.6	0.01	2,416.6	0.01	0.0	0.00
Effort	161,356.2									
Total Panfish	783,291.3	4.85	237,374.2	1.47	545,917.0	3.38	544,680.8	3.38	1,236.2	0.01

Table 9. Estimated warm water gamefish catch, harvest, and release on Sodus Bay from 4/1/2008 to 3/31/2009.

Species	Catch		Harvest		Release		Legal Release		Sublegal Release	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Daytime Boat Fishing										
Chain pickerel	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Northern pike	2,166.6	0.04	98.0	0.00	2,068.6	0.03	1,329.9	0.02	738.6	0.01
Smallmouth bass	1,930.7	0.03	78.2	0.00	1,852.5	0.03	859.2	0.01	993.3	0.02
Largemouth bass	49,697.4	0.83	1,829.8	0.03	47,867.7	0.80	29,548.4	0.50	18,319.2	0.31
Walleye	20.7	0.00	1.5	0.00	19.2	0.00	19.2	0.00	0.0	0.00
Total	53,815.4	0.90	2,007.4	0.03	51,807.9	0.87	31,756.8	0.53	20,051.1	0.34
Effort	59,560.0									
Daytime Shore Fishing										
Chain pickerel	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Northern pike	699.1	0.03	11.1	0.00	688.0	0.03	262.5	0.01	425.5	0.02
Smallmouth bass	413.8	0.02	120.2	0.01	293.6	0.01	168.5	0.01	125.0	0.01
Largemouth bass	13,091.0	0.55	517.6	0.02	12,573.3	0.53	8,943.2	0.38	3,630.1	0.15
Walleye	20.8	0.00	0.0	0.00	20.8	0.00	0.0	0.00	20.8	0.00
Total	14,224.6	0.60	648.9	0.03	13,575.7	0.58	9,374.3	0.40	4,201.5	0.18
Effort	23,587.8									
Daytime Ice Fishing										
Chain pickerel	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Northern pike	578.3	0.01	463.5	0.01	114.8	0.00	87.7	0.00	27.2	0.00
Smallmouth bass	20.6	0.00	0.0	0.00	20.6	0.00	6.4	0.00	14.2	0.00
Largemouth bass	1,133.0	0.02	9.2	0.00	1,123.8	0.02	742.8	0.01	381.0	0.01
Walleye	19.3	0.00	19.3	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Total	1,751.3	0.02	492.0	0.01	1,259.3	0.02	836.9	0.01	422.4	0.01
Effort	74,142.1									
Nighttime Boat Fishing										
Chain pickerel	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Northern pike	154.0	0.08	0.0	0.00	154.0	0.08	136.2	0.07	17.8	0.01
Smallmouth bass	99.1	0.05	0.0	0.00	99.1	0.05	31.1	0.02	68.1	0.04
Largemouth bass	4,058.3	2.09	50.5	0.03	4,007.7	2.07	2,427.2	1.25	1,580.5	0.81
Walleye	25.5	0.01	19.3	0.01	6.3	0.00	6.3	0.00	0.0	0.00
Total	4,336.9	2.24	69.8	0.04	4,267.1	2.20	2,600.7	1.34	1,666.4	0.86
Effort	1,940.1									
Nighttime Shore Fishing										
Chain pickerel	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Northern pike	17.9	0.01	0.0	0.00	17.9	0.01	17.9	0.01	0.0	0.00
Smallmouth bass	48.7	0.02	0.0	0.00	48.7	0.02	0.0	0.00	48.7	0.02
Largemouth bass	1,135.5	0.53	18.6	0.01	1,116.9	0.53	553.2	0.26	563.7	0.27
Walleye	19.2	0.01	19.2	0.01	0.0	0.00	0.0	0.00	0.0	0.00
Total	1,221.3	0.57	37.8	0.02	1,183.5	0.56	571.1	0.27	612.3	0.29
Effort	2,126.3									
Total Fishing										
Chain pickerel	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Northern pike	3,615.8	0.02	572.5	0.00	3,043.3	0.02	1,834.2	0.01	1,209.1	0.01
Smallmouth bass	2,512.9	0.02	198.4	0.00	2,314.5	0.01	1,065.2	0.01	1,249.2	0.01
Largemouth bass	69,115.1	0.43	2,425.7	0.02	66,689.4	0.41	42,214.9	0.26	24,474.5	0.15
Walleye	105.6	0.00	59.3	0.00	46.3	0.00	25.5	0.00	20.8	0.00
Effort	161,356.2									
Total Gamefish	75,349.5	0.47	3,256.0	0.02	72,093.5	0.45	45,139.9	0.28	26,953.7	0.17

Table 10. Estimated cold water gamefish catch, harvest, and release on Sodus Bay from 4/1/2008 to 3/31/2009.

Species	Catch		Harvest		Release		Legal Release		Sublegal Release	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Daytime Boat Fishing										
Coho salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Chinook salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Landlocked salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Rainbow trout	0.7	0.00	0.0	0.00	0.7	0.00	0.0	0.00	0.7	0.00
Brown trout	5.1	0.00	1.3	0.00	3.8	0.00	3.8	0.00	0.0	0.00
Total	5.8	0.00	1.3	0.00	4.5	0.00	3.8	0.00	0.7	0.00
Effort	59,560.0									
Daytime Shore Fishing										
Coho salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Chinook salmon	10.3	0.00	10.3	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Landlocked salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Rainbow trout	10.8	0.00	7.2	0.00	3.6	0.00	3.6	0.00	0.0	0.00
Brown trout	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Total	21.2	0.00	17.5	0.00	3.6	0.00	3.6	0.00	0.0	0.00
Effort	23,587.8									
Daytime Ice Fishing										
Coho salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Chinook salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Landlocked salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Rainbow trout	22.0	0.00	8.9	0.00	13.2	0.00	13.2	0.00	0.0	0.00
Brown trout	40.9	0.00	40.9	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Total	62.9	0.00	49.8	0.00	13.2	0.00	13.2	0.00	0.0	0.00
Effort	74,142.1									
Nighttime Boat Fishing										
Coho salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Chinook salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Landlocked salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Rainbow trout	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Brown trout	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Total	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Effort	1,940.1									
Nighttime Shore Fishing										
Coho salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Chinook salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Landlocked salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Rainbow trout	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Brown trout	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Total	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Effort	2,126.3									
Total Fishing										
Coho salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Chinook salmon	10.3	0.00	10.3	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Landlocked salmon	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Rainbow trout	33.6	0.00	16.1	0.00	17.5	0.00	16.8	0.00	0.7	0.00
Brown trout	46.0	0.00	42.2	0.00	3.8	0.00	3.8	0.00	0.0	0.00
Lake trout	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Effort	161,356.2									
CW Gamefish	89.9	0.00	68.6	0.00	21.3	0.00	20.5	0.00	0.7	0.00

Table 11. Species caught and catch rate by target from interviews on Sodus Bay from April 1, 2008 to March 31, 2009. Bold indicates the number caught of the target species.

Boat Fishing Species Caught by Target																						
Target	Species Caught																			Effort	Directed	
	BBH	BLC	ROB	PSS	BGS	YP	CHP	NOP	SMB	LMB	WAE	COH	CHS	LLS	RT	BT	LT	Other	Total		Catch Rate	
Anything	41	21	431	1,078	1,519	803	0	28	63	842	1	0	0	0	0	0	0	80	4,907	2,522.2	1.95	
Bass	8	2	501	618	589	361	0	154	181	7,197	4	0	0	0	1	0	0	98	9,714	6,643.1	1.11	
Bullhead	17	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	19	13.0	1.31	
Gamefish	0	0	0	0	0	1	0	5	0	20	0	0	0	0	0	0	0	0	26	18.0	1.39	
Panfish	28	64	1,661	1,276	2,482	1,569	0	18	67	982	0	0	0	0	0	0	0	2	8,149	1,873.7	3.78	
Perch	13	2	5	150	527	10,512	0	17	10	112	0	0	0	0	0	1	0	65	11,414	1,602.8	6.56	
Pike	9	0	109	57	105	26	0	114	9	342	0	0	0	0	0	1	0	3	775	604.4	0.19	
Salmonids	0	0	0	9	19	21	0	16	5	12	0	0	0	0	0	0	0	0	82	98.7	0.00	
Walleye	0	0	7	8	2	8	0	4	0	18	10	0	0	0	0	0	0	22	79	94.7	0.11	
Total	116	89	2,714	3,197	5,243	13,301	0	356	335	9,526	15	0	0	0	1	2	0	270	35,165	13,470.5	2.61	
Shore Fishing Species Caught by Target																						
Target	Species Caught																			Effort	Directed	
	BBH	BLC	ROB	PSS	BGS	YP	CHP	NOP	SMB	LMB	WAE	COH	CHS	LLS	RT	BT	LT	Other	Total		Catch Rate	
Anything	27	3	35	329	780	481	0	1	14	71	1	0	0	0	0	0	0	6	1,748	630.5	2.77	
Bass	2	1	19	285	233	190	0	3	1	214	0	0	0	0	0	0	0	8	956	157.9	1.36	
Bullhead	43	0	0	21	61	52	0	1	0	3	0	0	0	0	0	0	0	0	181	84.7	0.51	
Gamefish	0	0	1	0	0	1	0	0	0	40	0	0	0	0	0	0	0	0	42	5.2	7.67	
Panfish	8	24	13	264	706	623	0	0	0	136	0	0	0	0	1	0	0	53	1,828	609.9	2.69	
Perch	0	1	1	54	85	1,643	0	0	3	42	0	0	0	0	0	0	0	15	1,844	231.9	7.08	
Pike	0	0	0	0	0	0	0	7	0	4	0	0	0	0	0	0	0	0	11	2.4	2.87	
Salmonids	0	0	0	0	0	1	0	0	0	0	0	0	1	0	3	0	0	0	5	28.1	0.14	
Walleye	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	4.0	0.25	
Total	80	29	69	953	1,865	2,991	0	12	18	510	2	0	1	0	4	0	0	82	6,616	1,754.6	3.77	
Ice Fishing Species Caught by Target																						
Target	Species Caught																			Effort	Directed	
	BBH	BLC	ROB	PSS	BGS	YP	CHP	NOP	SMB	LMB	WAE	COH	CHS	LLS	RT	BT	LT	Other	Total		Catch Rate	
Perch	0	0	5	161	556	41,414	0	42	4	108	2	0	0	0	2	4	0	65	42,363	9,505.5	4.36	
Pike	0	0	0	0	0	242	0	21	0	4	0	0	0	0	0	0	0	0	267	257.1	0.08	
Total	0	0	5	161	556	41,656	0	63	4	112	2	0	0	0	2	4	0	65	42,630	9,762.6	4.37	
Species Caught by Target																						
Target	Species Caught																			Effort	Directed	
	BBH	BLC	ROB	PSS	BGS	YP	CHP	NOP	SMB	LMB	WAE	COH	CHS	LLS	RT	BT	LT	Other	Total		Catch Rate	
Anything	68	24	466	1,407	2,299	1,284	0	29	77	913	2	0	0	0	0	0	0	86	6,655	3,152.7	2.11	
Bass	10	3	520	903	822	551	0	157	182	7,411	4	0	0	0	1	0	0	106	10,670	6,801.0	1.12	
Bullhead	60	0	0	22	61	52	0	1	0	4	0	0	0	0	0	0	0	0	200	97.7	0.61	
Gamefish	0	0	1	0	0	2	0	5	0	60	0	0	0	0	0	0	0	0	68	23.2	2.80	
Panfish	36	88	1,674	1,540	3,188	2,192	0	18	67	1,118	0	0	0	0	1	0	0	55	9,977	2,483.6	3.51	
Perch	13	3	11	365	1,168	53,569	0	59	17	262	2	0	0	0	2	5	0	145	55,621	11,340.3	4.72	
Pike	9	0	109	57	105	268	0	142	9	350	0	0	0	0	0	1	0	3	1,053	863.9	0.16	
Salmonids	0	0	0	9	19	22	0	16	5	12	0	0	1	0	3	0	0	0	87	126.8	0.03	
Walleye	0	0	7	8	2	8	0	4	0	18	11	0	0	0	0	0	0	22	80	98.7	0.11	
Totals	196	118	2,788	4,311	7,664	57,948	0	431	357	10,148	19	0	1	0	7	6	0	417	84,411	24,987.7	3.38	

Table 12. Total fishing effort and pressure estimates from western and central New York waters.

Water (year)	Angler-hrs	Trips	Angler-hrs/A	Trips/A	Source
Sodus Bay (2008-2009)					Present Survey
Open Water ¹	87,214	23,365	26.0	7.0	
Ice	74,142	13,629	22.1	4.1	
Irondequoit Bay (2007-08)					Sanderson (2009)
Open water ¹	96,197	23,946	58.3	14.5	
Ice	71,303	13,981	43.2	8.5	
Conesus Lake (2000-01)					Sanderson (2003)
Open water ¹	60,397	12,252	17.7	3.6	
Ice	25,872	6,917	7.6	2.0	
Hemlock Lake (2005-2006)					Sanderson et al. (2009)
Open water ²	35,278	8,820	19.6	4.9	
Ice	477	119	0.3	0.1	
Canadice Lake (2005-2006)					Sanderson et al. (2009)
Open water ²	26,419	9,110	40.7	14.0	
Ice	2,316	799	3.6	1.2	
Oneida Lake (2007-08)					Krueger et al. (2009)
Open water ³	369,495	13,323	7.2	0.3	
Ice	91,080	7,538	1.8	0.1	
Oneida Lake (2006-07)					Krueger et al. (2009)
Open water ³	373,041	13,264	7.3	0.3	
Ice	29,601	6,673	0.6	0.1	
Oneida Lake (2005-06)					Krueger et al. (2009)
Open water ³	313,398	11,259	6.1	0.2	
Ice	7,038	4,960	0.1	0.1	
Oneida Lake (2004-05)					Krueger et al. (2009)
Open water ³	291,663	10,367	5.7	0.2	
Ice	72,450	6,840	1.4	0.1	
Oneida Lake (2003-04)					Krueger et al. (2009)
Open water ³	274,275	9,564	5.4	0.2	
Ice	67,482	6,280	1.3	0.1	
Oneida Lake (2002-03)					Krueger et al. (2009)
Open water ³	193,545	6,945	3.8	0.1	
Ice	74,520	6,981	1.5	0.1	
Oneida Lake (1997-98)					VanDeValk et al. (1999)
Open water ⁴	316,796	35,635	6.2	0.7	
Ice	38,083	9,133	0.7	0.2	
Cassadaga Lake (1999-2000)					McKeown and Einhouse (2002)
Open water ³	21,731	4,435	93.7	19.1	
Ice	506	230	2.2	1.0	
Bear Lake (1999-2000)					McKeown and Einhouse (2002)
Open water ³	6,662	2,082	47.2	14.8	
Ice	1,998	740	14.2	5.2	
Chautauqua Lake (1998-99)					McKeown and Einhouse (2000)
Open water ³	339,609	71,846	25.8	5.5	
Ice	41,602	11,910	3.2	0.9	
Whitney Pt. Reservoir(1999-2000)					Bishop and Lemon (2002)
Open water ²	54,902	16,484	11.9	3.5	
Ice	11,382	3,542	2.5	0.8	

Notes: 1. Includes daytime boat and shore, nighttime boat and shore effort.
2. Daytime boat and shore effort.
3. Daytime boat effort only.
4. Includes daytime boat and nighttime boat effort.

Table 13. Estimated overall catch rates (#/ang hr) by species from western and central New York waters.

Water (year)	YP	LMB	SMB	WAE	Source
Sodus Bay (2008-2009)					Present Survey
Open Water ¹	2.27	0.78	0.03	0.001	
Ice	5.68	0.02	<0.01	<0.01	
Irondequoit Bay (2007-08)					Sanderson (2009)
Open water ¹	2.41	0.11	<0.01	<0.01	
Ice	5.39	<0.01	0.00	0.00	
Conesus Lake (2000-01)					Sanderson (2003)
Open water ¹	0.01	0.22	0.06	0.005	
Ice	0.05	0.01	<0.01	0.00	
Hemlock Lake					Sanderson et al. (2008)
Open water ²	0.01	0.08	0.08	<0.01	
Ice	na	na	na	0.00	
Canadice Lake					Sanderson et al. (2008)
Open water ²	0.02	0.05	0.06	na	
Ice	na	na	na	na	
Oneida Lake (2007-08)					Krueger et al. (2009)
Open water ³	0.52	0.19*	*	0.19	
Ice	0.58	na	na	0.26	
Oneida Lake (2006-07)					Krueger et al. (2009)
Open water ³	0.58	0.19*	*	0.22	
Ice	0.55	na	na	0.12	
Oneida Lake (2005-06)					Krueger et al. (2009)
Open water ³	0.07	0.17*	*	0.19	
Ice	0.03	na	na	0.05	
Oneida Lake (2004-05)					Krueger et al. (2009)
Open water ³	0.08	0.15*	*	0.63	
Ice	0.17	na	na	0.09	
Oneida Lake (2003-04)					Krueger et al. (2009)
Open water ³	0.24	0.24*	*	0.43	
Ice	0.63	na	na	0.23	
Oneida Lake (2002-03)					Krueger et al. (2009)
Open water ³	0.44	0.19*	*	0.23	
Ice	1.00	na	na	0.12	
Oneida Lake (1997-98)					VanDeValk et al. (1999)
Open water ⁴	0.38	na	0.10	0.18	
Ice	1.60	n/a	0.00	0.05	
Cassadaga Lake (99-2000)					McKeown and Einhouse (2002)
Open water ³	0.38	0.21	0.07	0.002	
Ice	0.65	0.00	0.00	0.00	
Bear Lake (99-2000)					McKeown and Einhouse (2002)
Open water ³	0.59	0.04	0.02	0.003	
Ice	0.30	0.00	0.00	0.06	
Chautauqua Lake (1998-99)					McKeown and Einhouse (2000)
Open water ³	1.11	0.04	0.04	0.16	
Ice	2.02	0.00	0.00	0.11	
Whitney Pt. Reservoir(1999-2000)					Bishop and Lemon (2002)
Open water ²	0.16	0.11*	*	0.30	
Ice	0.15	0.00	0.00	0.09	

* reported as "black bass"

- Notes: 1. Includes daytime boat and shore, nighttime boat and shore fishing.
2. Daytime boat and shore fishing.
3. Daytime boat fishing only.
4. Includes daytime boat and nighttime boat fishing.

Table 14. Targeted catch rates (#/ang hr) by species from western and central New York waters.

Water (year)	YP	LMB	SMB	WAE	Source
Sodus Bay (2008-2009)					Present Survey
Open Water ¹	6.62	1.09	0.03	0.11	
Ice	4.36	na	na	na	
Irondequoit Bay (2007-08)					Sanderson (2009)
Open water ¹	8.63	0.80	0.02	0.02	
Ice	5.39	na	na	na	
Irondequoit Bay (1985)					Lane (1988)
Open water diaries ³	na	0.70	0.30	na	
Conesus Lake (2000-01)					Sanderson (2003)
Open water ¹	0.00	0.45	0.13	0.05	
Ice	0.24	0.15	0.00	0.00	
Hemlock Lake					Sanderson et al.
Open water ²	0.66	0.40	0.46	0.00	(2008)
Ice	na	na	na	na	
Canadice Lake					Sanderson et al.
Open water ²	0.07	0.13	0.16	na	(2008)
Ice	na	na	na	na	
Oneida Lake (2007-08)					Krueger et al. (2009)
Open water ³	1.79	0.79*	*	0.30	
Ice	0.68	na	na	0.29	
Oneida Lake (2006-07)					Krueger et al. (2009)
Open water ³	2.99	0.69*	*	0.31	
Ice	na	na	na	na	
Oneida Lake (2005-06)					Krueger et al. (2009)
Open water ³	1.51	0.70*	0.54	0.25	VanDeValk et al.
Ice	0.13	na	na	0.10	(2006)
Oneida Lake (2004-05)					Krueger et al. (2009)
Open water ³	0.64	0.62*	0.41	0.75	VanDeValk et al.
Ice	0.40	na	na	0.12	(2005)
Oneida Lake (2003-04)					Krueger et al. (2009)
Open water ³	1.10	0.71*	*	0.58	
Ice	0.71	na	na	0.34	
Oneida Lake (2002-03)					Krueger et al. (2009)
Open water ³	2.32	0.52*	*	0.35	
Ice	1.22	na	na	0.18	
Oneida Lake (1997-98)					VanDeValk et al.
Open water ⁴	2.50	na	0.32	0.21	(1999)
Ice	1.41	na	0.00	0.04	
Cassadaga Lake (99-2000)					McKeown and
Open water ³	2.89	0.46	0.50	na	Einhouse (2002)
Ice	na	na	na	0.00	
Bear Lake (99-2000)					McKeown and
Open water ³	20.0	0.20	0.29	na	Einhouse (2002)
Ice	na	na	na	0.04	
Chautauqua Lake (1998-99)					McKeown and
Open water ³	6.98	0.23	0.12	0.33	Einhouse (2000)
Ice	4.38	na	na	0.20	
Whitney Pt. Reservoir(1999-2000)					Bishop and Lemon
Open water ²	2.17	0.34*	*	0.49	(2002)
Ice	0.30	na	na	0.24	

* reported as “black bass”

- Notes: 1. Includes daytime boat and shore, nighttime boat and shore fishing.
2. Daytime boat and shore fishing.
3. Daytime boat fishing only.
4. Includes daytime boat and nighttime boat fishing.

Table 15. Ice Fishing effort and associated yellow perch harvest at Conesus Lake from 1965 to 2001. (From Lane 1993, Sanderson 2003, and Sanderson 2009).

Year	Angler Trips	Trip Duration (hr)	Angler Hours	Number of Perch Harvested	Harvest Rate (Perch/angler hr.)	Days Safe Ice
1965	14,500	4.7	68,585	121,945	1.78	77
1971	28,142	4.0	111,490	172,198	1.54	81
1973	17,308	4.6	79,859	129,730	1.62	46
1974	17,629	4.5	78,517	84,946	1.08	50
1988	780**	4.5*	3,509	not calculated	not calculated	74
1992	2,168**	4.5*	9,756	2,880	0.30	51
2001	6,917	3.7	25,872	1,398	0.05	84
2008 Irondequoit Bay	13,981	5.1	71,303	151,248	2.12	74
2009 Sodus Bay	13,630	5.4	74,142	123,634	1.67	76

* Average of angler trip durations from 1965 - 1974

** Calculated using average angler trip duration 1965 - 1974

Table 16. Potential reduction in yellow perch harvest by a 25 fish limit from 2008-2009 Sodus Bay interviews.

Parties/Anglers Interviewed that Kept more than 25 Yellow Perch												
Location	Interviews	% Interviews	Anglers Interviewed	% Anglers Interviewed	YP Kept	% YP Kept	25 YP Limit	% 25 YP Limit of YP Kept	YP Saved	% YP Kept	YP Kept under 25 YP Limit	% YP Kept Reduced
Boat	31	1.6%	56	1.3%	2,299	46.2%	1,400	39.1%	899	18.1%	4,074	18.1%
Ice	40	5.1%	59	3.3%	2,151	16.9%	1,475	31.4%	676	5.3%	12,084	5.3%
Shore	1	0.2%	1	0.1%	39	4.2%	25	35.9%	14	1.5%	923	1.5%
Total	72	2.2%	116	1.7%	4,489	24.0%	2,900	35.4%	1,589	8.5%	17,081	8.5%
				YP/Angler	38.70		25.00		13.70			